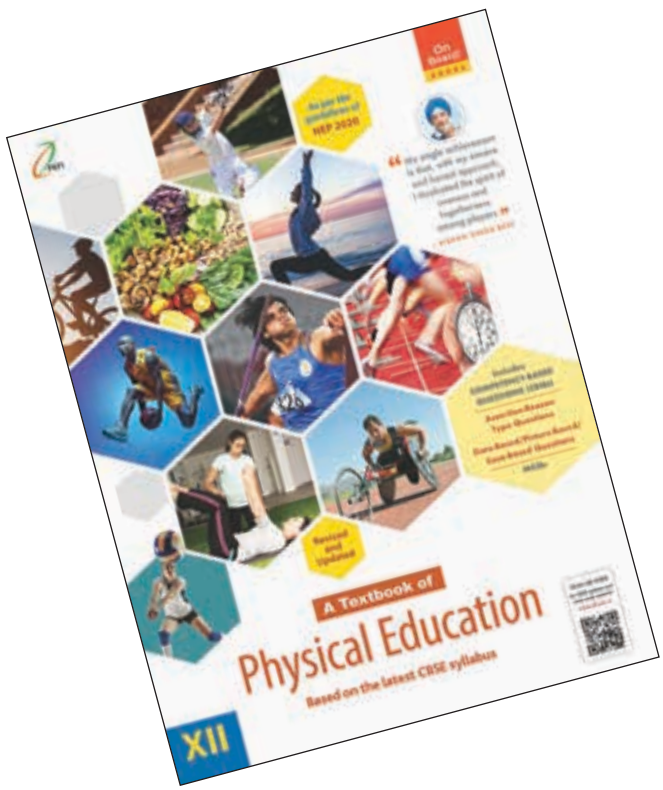
TEACHER'S HANDBOOK

A TEXTBOOK OF
PHYSICAL EDUCATION

Book 12



On Board! BOOKS

An imprint of Ratna Sagar P. Ltd.

CHAPTER 1

MANAGEMENT OF SPORTING EVENTS

P. 24–29

A. Objective Type/ Multiple-Choice Questions

I. Multiple-Choice Questions:

1. Which of the following is a part of sports management?

(a) Planning

(b) Directing and Organising

(c) Staffing and Controlling

(d) All of these

Ans. (d) All of these

2. Identify which one of these is not the objective of planning? **(CBSE SP 2021 Term 1)**

(a) Enhance creativity

(b) Increase efficiency

(c) Reduce chances of mistake

(d) Facilitates poor coordination

Ans. (d) Facilitates poor coordination

3. What is the meaning of staffing?

(a) Interviewing staff

(b) Selecting and recruiting staff

(c) Promoting staff

(d) All of these

Ans. (b) Selecting and recruiting staff

4. Which of the following are salient aspects of a tournament?

(a) Nurturing social skills

(b) Means of recreation

(c) Promoting national and international integration

(d) All of these

Ans. (d) All of these

5. What are the types of league tournaments?

(a) Single and Double league tournament

(b) Single and Mixed double league tournament

(c) Double and Combination league tournament

(d) Simple and Complex league tournament

Ans. (a) Single and Double league tournament

6. Which fixture is also known as 'Berger system'? **(CBSE SP 2021 Term 1)**

(a) Knockout fixture

(b) Round Robin fixture

(c) Combination fixture

(d) Challenge tournament

Ans. (b) Round Robin fixture

7. What is the formula to calculate the number of matches in a single league tournament? **(CBSE 2020)**

(a) N – 1 (b) N(N – 1)

(c) N(N – 1)/2 (d) 2N –N

Ans. (c) N(N – 1)/2

8. Which formula is used to find out the number of matches in a double league tournament?

(a) N × N (b) N (N – 1)

(c) (N – 1) (d) N × N × N

Ans. (b) N(N – 1)

9. What is the formula to find the number of matches in a knockout tournament?

(a) N (b) N (N – 1)

(c) (N – 1) (d) (N + 1)

Ans. (c) (N – 1)

10. The formula for determining the number of rounds in a single league fixture when the number of teams is even? **(CBSE SP 2021 Term 1)**

(a) N (b) (N – 1)/2

(c) N – 1 (d) N(N – 1)/2

Ans. (c) N – 1

11. What is the formula to divide an odd number of teams in the upper half for a knockout fixture? **(CBSE SP 2021 Term 1)**

(a) (N + 1)/2 (b) (N – 1)/2

(c) N(N – 1)/2 (d) N(N + 1)/2

Ans. (a) (N + 1)/2

12. Formula for determining the number of bye in the lower half of a knockout fixture when number of byes are odd? **(CBSE SP 2021 Term 1)**

(a) (NB + 1)/2 (b) (NB – 1)/2

(c) NB /2 (d) NB + 1

Ans. (a) (NB + 1)/2

13. How many byes will be given if there are 17 teams? **(CBSE SP 2022)**

(a) 1 (b) 8

(c) 15 (d) 12

Ans. (c) 15

14. How many matches will be played in the knockout tournaments first round if there are 15 teams? **(CBSE SP 2022)**

(a) 8 (b) 7

(c) 5 (d) 6

Ans. (b) 7

15. It is a process/procedure of shuffling the position of good teams so that they don't meet each other in an early stage of the competition and spectator interest is kept alive till finals. What is the name of this process?

(a) Intramural (b) Seeding

(c) Fixture (d) Extramural

Ans. (b) Seeding

16. Which one of the following is an advantage of Round Robin tournament? **(CBSE 2020)**

(a) Time consuming

(b) More number of officials

(c) Expensive

(d) Decides the real strong team

Ans. (d) Decides the real strong team

17. The total number of matches in a knock out tournament of 34 teams are **(CBSE 2020)**

(a) 31 (b) 32

(c) 33 (d) 35

Ans. (c) 33

18. How many rounds will be played if the number of teams are 29 in the knockout fixture? **(CBSE SP 2021 Term 1)**

(a) 5 (b) 6

(c) 7 (d) 3

Ans. (d) 3

19. Which sports competition is organised within the school itself?

(a) Extramural (b) Intramural

(c) Inter-state (d) None of these

Ans. (b) Intramural

20. Which of these is not one of the methods used for fixtures in League or Round Robin tournaments?

(a) Cyclic method (b) Spiral method

(c) Staircase method (d) Tabular method

Ans. (b) Spiral method

21. Consolation tournaments are a part of which type of fixture? **(CBSE SP 2021 Term 1)**

(a) Knockout (b) League

(c) Combination (d) None of these

Ans. (a) Knockout

II. Match the following:

List I – Category	List II – Name
(i) Technical committee	(1) To provide shifting facility
(ii) Finance committee	(2) To resolve dispute
(iii) Transport committee	(3) To deals with money and expenditure
(iv) First aid committee	(4) To provide medical facilities

Select the correct set of options:

(a) (i)–(2), (ii)–(3), (iii)–(1), (iv)–(4)

(b) (i)–(3), (ii)–(2), (iii)–(1), (iv)–(4)

(c) (i)–(2), (ii)–(3), (iii)–(4), (iv)–(1)

(d) (i)–(4), (ii)–(3), (iii)–(1), (iv)–(2)

Ans. (a) (i)–(2), (ii)–(3), (iii)–(1), (iv)–(4)

III. Assertion-Reason Type Questions: CBQ

Given below are the two statements labelled Assertion (A) and Reason (R).

1. A: Knockout tournaments save cost and time and make each match intensive.

R: In this type of format, players or teams have to consistently give their best performance to avoid elimination.

2. A: Planning is the foremost function in sports.

R: Planning gives a view of future course of action. **(CBSE SP 2020)**

In the context of the two statements given above, which one of the following is correct?

(a) Both (A) and (R) are true and (R) is the correct explanation of (A).

(b) Both (A) and (R) are true but (R) is not the correct explanation of (A).

(c) (A) is true, but (R) is false.

(d) (A) is false, but (R) is true.

Ans. 1. (a) Both (A) and (R) are true and (R) is the correct explanation of (A).

2. (a) Both (A) and (R) are true and (R) is the correct explanation of (A).

IV. Data-Based Questions: CBQ

Given below is the tournament fixture procedure of a volleyball national competition.

1-2							
1-3	2-3						
1-4	2-4	3-4					
1-5	2-5	3-5	4-5				
1-6	2-6	3-6	4-6	5-6			
1-7	2-7	3-7	4-7	5-7	6-7		
1-8	2-8	3-8	4-8	5-8	6-8	7-8	
1-9	2-9	3-9	4-9	5-9	6-9	7-9	8-9

On the basis of the above data, answer the following questions:

1. In the fixture shown above, which of the following is not needed?

(a) Byes (b) Knockout

(c) Seeding (d) Consolation

2. In League tournaments, the winner is decided by

(a) British method (b) American Method

(c) No of matches won (d) Both (a) and (b)

3. Which of the following is not a league fixture procedure?

(a) Ladder method (b) Staircase method

(c) Cyclic method (d) Tabular method

Ans. 1. (a) Byes

2. (a) British method

3. (a) Ladder method

V. Picture-Based Questions: CBQ

Your school is organising annual sports day. To make this event successful, write the names of any four important committees with one responsibility.

Ans. i. Publicity Committee: Advertise the event

ii. Finance Committee: To deal with money and expenditure

iii. Reception Committee: To welcome chief guest and players

iv. Announcement Committee: Make announcements regarding opening and closing ceremony.

VI. Case-Based Questions: CBQ

1. Rohan and Satish organised a volleyball tournament on Knockout basis. They found that the spectators were losing interest in the tournament because two good teams were out of the tournament as they were defeated in the beginning. Which provision could have avoided this kind of situation? **(CBSE SP 2021 Term 1)**

(a) Bye (b) Seeding

(c) Pools (d) Halves

Ans. (b) Seeding

2. ABC School is one of the reputed schools in their location for the number of sports facilities it provides to its stakeholders. Keeping that in consideration CBSE sports cell has given them the responsibility of conducting CBSE Football cluster. Total 35 teams have sent their entry for participation in the tournament. Due to the large number of teams willing to participate, the school should conduct the competition by which fixture? **(CBSE SP 2021 Term 1)**

(a) League (b) Knockout

(c) Staircase (d) Challenge

Ans. (b) Knockout

3. A fixture has to be prepared for a knockout tournament between 15 teams. On the basis of the case given, answer the following questions:

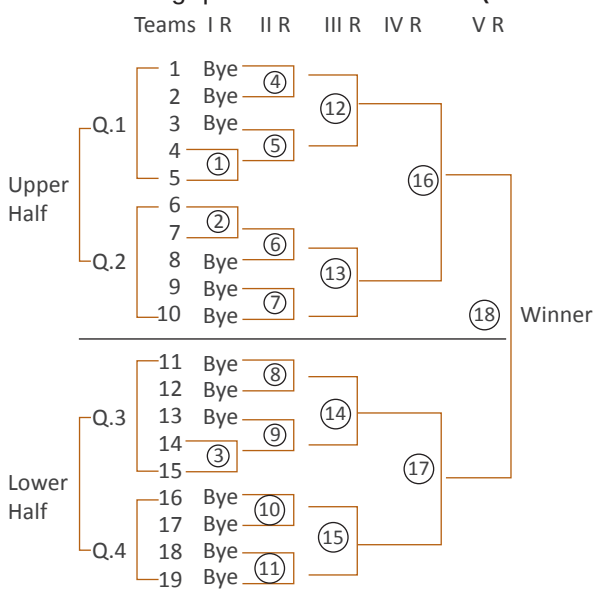
(a) How many teams will the lower half have?

(b) How many byes will the upper half have?

(c) In case of byes, the first bye goes to the ..... team of the ..... half.

Ans. (a) 7, (b) 0, (c) last, lower

4. On the basis of fixture given below, answer the following questions: **(CBSE SP 2022)**



(a) Total number of matches in second round are .....

(b) What is the formula for calculating the total number of matches?

(c) The fourth round in this case can also be called as .....

(d) What is the formula for calculating the number of byes?

OR

The formula for calculating number of rounds is .....

Ans. (a) 8, (b) N – 1, (c) Semi-final, (d) 2^n – N

B. Very Short Answer Type Questions

1. What do you mean by planning? **(CBSE 2016)**

Ans. Planning is a course of action in order to reach a definite goal.

2. What do you mean by a tournament?

Ans. A tournament is a type of contest in which several players participate and defeat opponents in various rounds to get to the final match and win it.

3. Round Robin tournament is of two types. Name them and give one major difference between them. **(CBSE 2017)**

Ans. Single league tournament and double league tournament. In single league tournament, each team/player plays against every other participant once. In double league tournament, each team/ player plays against every other participant twice.

4. Fixtures are the schedule, fixed for the matches. What is a bye? **(CBSE 2017)**

Ans. A bye is a dummy team that participates in the second round to even out the number. The number of byes in a fixture is the difference between the number of participants and the next highest number which is the power of 2.

5. What is the difference between single league tournament and double league tournament?

Ans. In single league tournament, each team/player plays against every other participant once. In double league tournament, each team/player plays against every other participant twice.

6. What is seeding? **(CBSE 2011, 2012)**

Ans. Seeding is a tactic used in sports events in which specific teams are sorted into a bracket in such a way that the strongest teams meet later in the tournament.

7. Write the formula for giving a bye. **(CBSE 2016)**

Ans. The number of byes in a fixture is the difference between the number of participants and the next highest number which is the power of 2. If there are two very strong teams, one will be placed on the top of the upper half and the other at the bottom of the lower half. If there are four strong teams, then the third will be placed on the top of the lower half, and the fourth at the bottom of the upper half. This usually works if the number of teams to be seeded are the power of 2. Save for seeded teams, the rest are divided by drawing lots.

8. What is a consolation tournament?

Ans. A consolation tournament is held to give second chance to defeated players in knockout tournaments.

C. Short Answer Type-I Questions

1. Define sports management.

Ans. Sports management can be defined as the coordination of resources, technologies, processes, personnel and situational contingencies for the efficient production and exchange of sports services.

2. What is a short-term planning? Explain giving a suitable example.

Ans. Short-term planning is setting goals that the organisation hopes to achieve within the next few months to a year. For example, an athletic shoe firm could aim to buy enough inventory of a specific model of shoe so that its salesperson can stock suppliers with enough shoes to match customer demand for the future year.

3. State the responsibilities of finance committee.

Ans. Finance Committee is primarily related to financial management for the sport event. It prepares budget to purchase equipment, medals, etc. before the sport event. During the event, the finance committee checks the cash flow, payments, remuneration of officials, etc. This committee settles all the bills, prepares report, etc. once the event is over.

4. What are the different types of league tournaments?

Ans. There are two types of league tournament. Single league tournament, in which each team player plays against every other participant once or double league tournament, in which each team/player plays against every other participant twice.

5. Write any two advantages of league tournament.

Ans. Advantages of League or Round Robin Tournaments

- Leagues give each participant a chance to prove itself against every opponent involved in the tournament. As such, there is no question of missed opportunities. It is a fair way of determining the best and most consistent competitor. Many footballs and cricket tournaments use this approach.
- There is no such thing as getting lucky in round robins. Even if a team defeats another in the first round due to sheer luck, it will still have to outperform the others.

6. Define the term fixture. **(CBSE 2018)**

Ans. Fixture is a sport event or its date. Further, it is a process of arranging the team in systematic order in various groups for competitive fights for physical activity.

7. How are byes fixed in a knockout tournament?

Ans. First of all, lots will be drawn and the total number of teams will be divided into 2 two halves. Following that, byes will be fixed in the following manner:

- The first bye goes to the last team of the lower half, and the second to the first team of the upper half.
- The third bye goes to the first team of the lower half, and the fourth to the last team of the upper half.
- This sequence will be followed while assigning the next bye or byes.

8. Explain briefly the cyclic method.

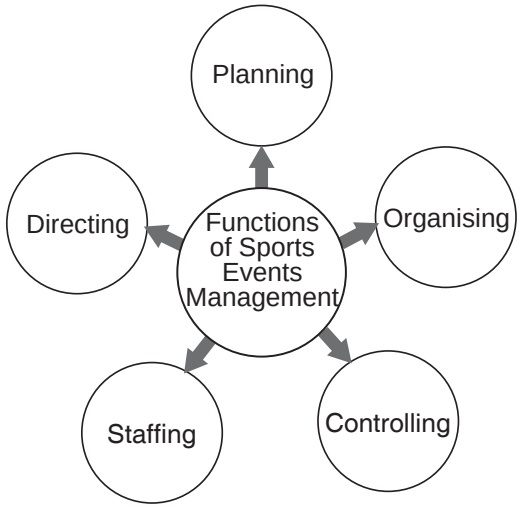
Ans. Cyclic method: Cyclic method has different applications for even and odd numbers of teams. In the former case, the 1st team is placed at the top of the right hand side. The remaining team numbers are put in ascending order consecutively and then upward on the left side. In the latter, the bye is fixed on the top of the right side, and then followed by the rest of the procedure. Teams are rotated from right to left.

If N (number of teams) is even, the number of rounds will be (N – 1).

D. Short Answer Type-II Questions

1. Create a mind map depicting the functions of sports management.

Ans.



2. What is controlling in sports management?

Ans. Controlling comprises all the processes created by leaders to monitor success. Controlling entails ensuring that performance adheres to established guidelines. Controlling consists of three steps:

- Setting performance criteria.
- Comparing actual performance to standards.
- Taking remedial action as needed.

3. What is directing in sports management?

Ans. Directing is the activity element of the management process. It is commonly referred to as the directing or leading function. This is the step where everything takes place. The sports manager is responsible for coordinating the actions of the personnel in order to achieve corporate goals. The manager's responsibilities as a leader include delegating, communicating, managing conflict, managing change, and inspiring staff. The manager employs a variety of talents to carry out these tasks, which are detailed in the following section of this chapter.

4. List down the important committees during a tournament. **(CBSE 2011)**

Ans. Publicity Committee, Boarding and Lodging Committee, Transport Committee, Grounds and Equipment Committee, Refreshment and Entertainment Committee, Reception Committee, Decoration and Ceremony Committee, Committees on Entries and Programmes, etc. are various important committees during a tournament.

5. What is the task of the decoration and ceremony committees?

Ans. Decoration and Ceremony Committees work in tandem with the refreshment and entertainment committee and the reception committee to make the ceremonies vibrant and well coordinated. They decorate the viewing areas and stages so that the venue looks attractive. This committee is also charged with arranging for certificates, medals and trophies.

6. Your school is organising 'Run for Unity'. Explain the responsibilities of accreditation, technical and finance committee. **(CBSE 2016)**

Ans.
- **Accreditation committee:** This committee registers all the participants with an operational role. The production, distribution and validation of passes is the duty of this committee.
- **Technical committee:** Technical committee looks after the technical aspects of the tournament. It ensures that the field is safe for play for all participants. It ensures the quality of equipment.
- **Finance committee:** This committee prepares the budget of the tournament and maintains every expenditure related to tournament.

7. Give two reasons why tournaments are important.

Ans. The purpose of a tournament is to establish the one team or player who has outperformed the rest. Tournaments introduce the youth to stress that is different from the one they face in the classroom; on the field, their alertness of mind, physical strength, coordination between the mind and the body, and natural and acquired reflexes are all put to test in front of spectators.

8. What are the three types of tournaments?

Ans. Three types of tournaments are knockout; league or round Robin and combination.

9. League tournament is a better way to judge the best team of the tournament. Comment.

(CBSE 2020)

Ans. League or Round Robin tournament, as opposed to knockouts, allows each team or player to compete against every other participant in the tournament. A league tournament is a better way to determine the best team in a tournament because each team has the most opportunities to show its efficiency. Teams and players have a lot of chances to show and improve her/his performance. The teams which score more points are eligible for next matches in the tournament.
- Leagues give each participant a chance to prove itself against every opponent involved in the tournament. As such, there is no question of missed opportunities. It is a fair way of determining the best and most consistent competitor. Many footballs and cricket tournaments use this approach.
- There is no such thing as getting lucky in round robins. Even if a team defeats another in the first round due to sheer luck, it will still have to outperform the others.
- Since leagues accurately measure the performances of a particular team or player, their strengths and weaknesses can be evaluated with greater certainty.
- League tournaments tend to be popular and also earn a lot of revenue. Fans get to cheer their players/teams through a greater number of matches. (any three)

10. What is the difference between round robin and knockout?

Ans.

In knockout tournaments, the defeated team or player is eliminated with no scope of participating further. As for the winner, they continue competing against other opponents until they eventually lose or win the tournament.	League or round Robin tournament, as opposed to knockouts, allows each team or player to compete against every other participant in the tournament. This can be either of two variations: single league tournament, in which each team/ player plays against every other participant once or double league tournament, in which each team/player plays against every other participant twice.

11. What types of statistics are used while drawing fixtures for knockouts?

Ans. For knockouts, the total number of matches to be played in a single tournament is determined by the following formula:

$$(N - 1)$$

where N is the number of teams/individual players.

So, if in a tournament there are 8 participants, then the total number of matches played will be 7. In the first phase, there will be 4 matches (1 against 1); in the second, the four winners will advance further to decide the two finalists, so there will be 2 matches. Counting the final match, there are 7 in total, as derived from the formula. Lots are drawn to decide the pairs of competitors.

12. Define bye. Explain the rules of giving bye with the help of an example. **(CBSE SP 2022)**

Ans. **Bye:** When a team or a player does not face an opponent in the primary round due to allotment of draws, random lottery system is used to give a bye to any participating team/player. In a tournament, the organising committee assigns byes to the teams due to many reasons. They are as follows:

- Uneven distribution of teams in tournament
- Keeping previous winners in different pool to create balanced competition
- Avoiding one particular team from playing more matches on a single day than the other teams.

First of all, lots will be drawn and the total number of teams will be divided into 2 two halves. Following that, byes will be fixed in the following manner:

- The first bye goes to the last team of the lower half, and the second to the first team of the upper half.
- The third bye goes to the first team of the lower half, and the fourth to the last team of the upper half.
- This sequence will be followed while assigning the next bye or byes.

13. How many byes will be allotted in a knockout in which 15 teams are participating?

Ans. Number of Bye = (16 – 15) = 1 (refer to pages 17–18 of textbook)

14. Draw a fixture of 11 football teams participating in a tournament on the basis of a knockout.

(CBSE 2016)

Ans. Refer to pages 18-20 of the textbook.

15. How many rounds will be there in a knockout of (i) 10 teams and (ii) 13 teams?

Ans. (i) When the number of participating teams or players (N) is the power of two (i.e. 2, 4, 8, 16, 32, and so on), then number of rounds will be the number of 2's making up N. For instance, when

N = 10, number of rounds will be

2 × 2 × 2 × 2 = three 4s = 4,

(ii) N = 13, number of rounds will be

2 × 2 × 2 × 2 = four 2s = 4.

When N is not the power of 2, the number of rounds will be based on the next highest power of 2.

16. Draw a knockout fixture of 24 teams.

(CBSE SP 2016)

Ans. Refer to pages 18-20 of the textbook. Follow the same method to draw a fixture of 24 teams.

17. Differentiate between the cyclic method and staircase method.

Ans. Cyclic method: Cyclic method has different applications for even and odd numbers of teams. In the former case, the 1st team is placed at the top of the right hand side. The remaining team numbers are put in ascending order consecutively and then upward on the left side. In the latter, the bye is fixed on the top of the right side, and then followed by the rest of the procedure. Teams are rotated from right to left.

If N (number of teams) is even, the number of rounds will be (N – 1).

Staircase method: In this type, fixtures are arranged in such a way that it resembles a ladder or a staircase. There is no need to give byes to any team as there is no issue of odd or even number of teams.

E. Long Answer Type Questions

1. What are the various functions of sports management?

Ans. Functions of Sports Management

- Planning: Planning is a goal-oriented activity. It gives a view of future course of action. The planning role entails identifying organisational goals and selecting the best methods for achieving these goals.
- Organising: After planning, the sports manager then takes up the task of organising. The organising function kickstarts the implementation of plans. The manager selects which sorts of duties must be completed and who will be accountable for doing them as part of the organisational role.
- Staffing: Staffing can begin after the organisational chart has been created and the position qualifications have been determined. The responsibility for the roles in the organisational structure is determined by staffing. Staffing is the process of effectively recruiting and selecting people to fill roles in a company. Position qualifications obtained during the organising function are used in this situation.
- Directing: This is the activity element of the management process. It is commonly

referred to as the directing or leading function. This is the step where everything takes place. The sports manager is responsible for coordinating the actions of the personnel in order to achieve corporate goals. The manager's responsibilities as a leader include delegating, communicating, managing conflict, managing change, and inspiring staff. The manager employs a variety of talents to carry out these tasks, which are detailed in the following section of this chapter.

- Controlling: Controlling comprises all the processes created by leaders to monitor success. Controlling entails ensuring that performance adheres to established guidelines.

2. Describe how various planning committees function in sports events.

Ans. Various planning committees function in the following manner in a sports event.

- Publicity Committee: The publicity committee completes this preparation before the games. During the games they maintain the interest level for the games with proper advertisement. They also coordinate with the media for coverage during and after the games.
- Boarding and lodging committee: This committee takes care of accommodation and meals for the players, officials, and other members involved in the event. Before the games, they confirm the bookings. Once the tournament has started, they keep track of all boarding and lodgings, switches between departures and new arrivals, etc.
- Transport committee: The transport committee handles transportation facilities for the players, officials, etc. They arrange for buses and other vehicles to take the players and officials to the venue of the games from the places where they are staying.
- Grounds and equipment committee: This committee has the responsibility of ensuring that the grounds, fields, courts, etc. are in top condition. They also check the equipment and other gears to be used in the games to ensure that no mishap occurs and that plenty of equipment is available for all the players.
- Refreshment and entertainment committee: They supply drinks and refreshments to the guests, players, officials and other invitees. The entertainment programmes, such as opening song, closing dance, etc. are also arranged by this committee in advance.
- Reception committee: The reception committee welcomes the guests, players, officials, audiences, etc. during the opening and closing ceremonies.
- Decoration and ceremony committee: They decorate the viewing areas and stages so that the venue looks attractive. This committee is also charged with arranging for certificates, medals and trophies.
- Committees on entries and programmes: The committee on entries and programmes are tasked with sending out entry forms to various institutions early so that the latter can send in their applications on time. The committee then allots slots to the competitors, prepares fixtures if required, build a clear-cut schedule of the programmes and prints it so that it may be distributed to all involved parties.
- Committee for officials: There are many officials involved in a sporting event: judges, referees, umpires, recorders, starters, time keepers, lap scorers, clerks of the course, announcers, commentators, etc. The committee for officials selects and manages them for smooth functioning of the sports event.
- Announcement committee: The announcement committee is responsible for making announcements during the opening and closing ceremonies, games, important information like when an event is going to take place or changes in schedules, names of officials and players, running commentaries, etc.
- First aid committee: One of the most important committees in a sports event, the first aid committee works under the supervision of a medical expert. It provides first aid to injured players and ensures that they receive advanced medical attention if the need arises. The first aid team makes all necessary arrangements before the commencement of the sports event.

3. Explain pre-, during and post-game responsibilities of officials of various committees for organising a sports tournament smoothly. **(CBSE 2020)**

Ans. Pre-, during and post-game responsibilities of officials of various committees are as follows:

Technical Committee: Pre-sports event/ tournament: Before the event, it is the job of the Technical Committee to put forward a requisition to purchase equipment, invitation and confirmation from officials to conduct sports event, cleaning and layout of the fields, arrangement of equipment and stationery, preparation of fixtures, rules and regulation of the sports event.

During sports event/tournament: While the tournament is in progress, the Technical Committee is responsible for conducting matches, presence of the jury, cleaning and layout of the fields, collection of score sheets and other related papers from officials, preparation of merit list, etc.

Post sports event/ tournament: After the event is over, the Technical Committee arranges for the cleaning and layout of the fields, maintenance of the field, and placing of all equipment back to store.

Finance Committee: Pre sports event/ tournament: Before the event, It is the responsibility of Finance Committee to prepare the budget, to purchase sports equipment, stationery, medals, certificates, and other requirements as desired by the other committees, as well as preparing and finalizing the MoU with sponsors.

During sports event/ tournament: During the course of the event, the Finance Committee keeps a check on the outflow and inflow of finances including payment and remuneration to officials.

Post sports event/ tournament: Once the event is over, the Finance Committee examines all records related to settlement of the bills and accounts, and prepares the financial report. Refer to textbook for detail.

4. What is a knockout tournament? Explain different types of knockout tournaments. Draw a fixture of 21 teams on a knockout basis.

(CBSE 2012, 2015)

Ans. In boxing, a match is finished when an opponent is knocked down and unable to rise and return to the game within a certain time limit. This is called knockout. The concept of knockout tournaments is somewhat similar. In this type of tournament, the defeated team or player is eliminated with no scope of participating further. As for the winner, they continue competing against other opponents until they eventually lose or win the tournament.

Single knockout tournament, consolation tournament and double knockout tournament are different types of knockout tournament.

See page 19 of the textbook for a fixture of 21 teams on a knockout basis.

5. What is a league or round robin? Draw a fixture for 6 teams using round robin method.

(CBSE 2012)

Ans. League or Round Robin tournament, as opposed to knockouts, allows each team or player to compete against every other participant in the tournament. This can be either of two variations: single league tournament, in which each team/ player plays against every other participant once or double league tournament, in which each team/player plays against every other participant twice.

Example. Draw a fixture of 6 teams on a league basis according to the cyclic method.

Solution. Total number of teams
= 6 (Given)

Total number of matches

$$= \frac{N(N-1)}{2} = \frac{6(6-1)}{2}$$

$$= \frac{6 \times 5}{2} = \frac{30}{2} = 15 \text{ matches}$$

Number of rounds
= N – 1 = 6 – 1 = 5 rounds

Fixtures

I R		II R		III R		IV R		V R	
6	①	5	①	4	①	3	①	2	①
5	2	4	6	3	5	2	4	6	3
4 ←	3	3 ←	2	2 ←	6	6 ←	5	5 ←	4

6. Draw a fixture of 12 teams on a league basis according to the staircase method. How will you decide a winner in league tournament?

(CBSE 2019)

Ans. Fixture of 12 Team on the basis of staircase method

1-2										
1-3	2-3									
1-4	2-4	3-4								
1-5	2-5	3-5	4-5							
1-6	2-6	3-6	4-6	5-6						
1-7	2-7	3-7	4-7	5-7	6-7					
1-8	2-8	3-8	4-8	5-8	6-8	7-8				
1-9	2-9	3-9	4-9	5-9	6-9	7-9	8-9			
1-10	2-10	3-10	4-10	5-10	6-10	7-10	8-10	9-10		
1-11	2-11	3-11	4-11	5-11	6-11	7-11	8-11	9-11	10-11	
1-12	2-12	3-12	4-12	5-12	6-12	7-12	8-12	9-12	10-12	11-12

No. of Rounds = N – 1 = 12 – 1 = 11

No. of matches $= \frac{N(N-1)}{2} = \frac{12(12-1)}{2}$

$= \frac{12 \times 11}{2} = \frac{132}{2} = 66$

The following way is used to decide a winner:

(i) The team that wins the match gets
= 2 points.

(ii) The team that loses the match gets
= 0 point.

(iii) If match draws then each team gets
= 1 point.

After the tournament, all the teams are awarded the score as per their performance and the team which scores maximum is declared winner.

If the points of two teams are equal, then a match is held again between both teams.

7. Mention all calculations and steps involved to draw a knockout fixture of 19 teams, where 4 teams are to be seeded. **(CBSE 2018)**

Ans. Total no. of teams = 19 (N = 19)

No. of matches = (N – 1)

= 19 – 1 = 18

No. of teams in upper half $= \frac{(N + 1)}{2} = 10$

No. of teams in lower half $= \frac{(N - 1)}{2} = 9$

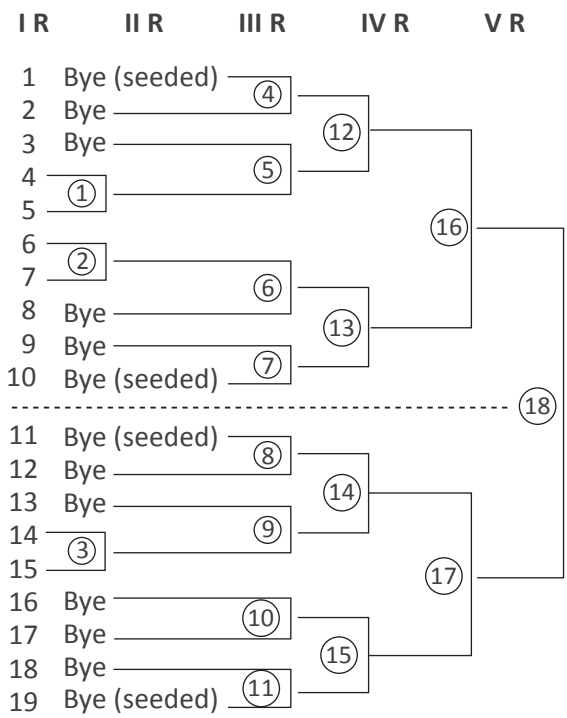
Total no. of byes (NB) = next power of 2 – N = 32 – 19 = 13

No. of byes in upper half $= \frac{NB - 1}{2} = 6$

No. of byes in lower half $= \frac{NB + 1}{2} = 7$

Seeding – 2 teams in upper half with byes

2 teams in lower half with byes



8. Draw a league fixture of 16 teams.

Ans. Number of teams = 16

Number of matches = N – 1 = 16 – 1 = 15

Number of teams in upper half = N/2 = 16/2 = 8

Number of teams in lower half = N/2 = 16/2 = 8

Number of byes = Next nearest power of 2 – Number of teams

= 16 – 16 = 0

Number of rounds = 4

For fixture, refer to pages 18-20 of the textbook.

9. Being sports captain of the school, prepare five important committees with their responsibilities to conduct one day Run for Health Race.

(CBSE 2015)

Ans. (i) **Publicity committee:** The publicity committee completes this preparation before the games. During the games they maintain the interest level for the games with proper advertisement. They also coordinate with the media for coverage during and after the games.

(ii) **Boarding and lodging committee:** The boarding and lodging committee takes care of accommodation and meals for the players, officials, and other members involved in the event. Before the games, they confirm the bookings. Once the tournament has started, they keep track of all boarding and lodgings, switches between departures and new arrivals, etc. They ensure that the guests are taken care of wherever they are staying. After the event is over, they are incharge of settling the bills and other fees incurred by the guests during their stay.

(iii) **Transport committee:** The transport committee handles transportation facilities for the players, officials, etc. They arrange for buses and other vehicles to take the players and officials to the venue of the games from the places where they are staying. Though preparations for logistics begin before the games start, it is during the tournament that the transport committee is at its busiest.

(iv) **Grounds and equipment committee:** This committee has the responsibility of ensuring that the grounds, fields, courts, etc. are in top condition. They also check the equipment and other gears to be used in the games to ensure that no mishap occurs and that

plenty of equipment is available for all the players. Their responsibilities start before the games. During the games, they have to maintain the grounds and equipment, and once the competition is over, they ensure that everything is in place and damaged equipment and areas reported for replacements or repairs.

(v) **Refreshment and entertainment committee:** They are different from the boarding and lodging committee. They supply drinks and refreshments to the guests, players, officials and other invitees. The entertainment programmes, such as opening song, closing dance, etc. are also arranged by this committee in advance.

F. Value -Based Question

Sports management is a process of setting objective and deciding how to accomplish them. It is the most important task of all administration. Like, there is a new school in our town. The school has a huge campus, so the school authorities have decided to introduce some sports that includes taekwondo, martial arts, archery, boxing, swimming, etc. The school has made it mandatory for each student. So that every student can participate in the competitions organised by the school. The idea of introducing such sports is appreciated by the parents of the students. Such sports help students to expand their knowledge and capabilities. These sports help to build confidence and provide healthy recreation.

Answer the following questions based on the above passage:

1. What do you understand by sports management?
2. What is the importance of sports and games for the students?
3. What are the values shown by the parents of the students in the school?

Ans. 1. Sports management can be defined as the coordination of resources, technologies, processes, personnel and situational contingencies for the efficient production and exchange of sports services.

2. Playing various sports helps them teach life skills such as teamwork, leadership, accountability, patience, and self-confidence and prepares them to face life challenges. Students get a chance to work on their physical and mental abilities to achieve goals in their life.

3. Coordination, positive attitude, decision-making, etc.

CHAPTER 2

CHILDREN AND WOMEN IN SPORTS

P. 44–49

A. Objective Type/Multiple-Choice Questions

I. Multiple-Choice Questions:

1. Which one of the following is not a cause of bad posture?

(a) Poor diet

(b) Daily exercise

(c) Poorly designed furniture

(d) Carrying heavy load

Ans. (a) Poor diet

2. The deformity shown in figure is caused due to

(a) malnutrition.

(b) illness.

(c) rickets.

(d) all of these.

Ans. (d) all of these.

3. Which of the following is not a cause of lordosis?

(a) Imbalanced diet (b) Cancer

(c) Obesity (d) Physical inactivity

Ans. (b) Cancer

4. Which of these asanas is suggested for relief from lordosis?

(a) Chakrasana (b) Vajrasana

(c) Halasana (d) Matsyasana

Ans. (c) Halasana

5. Which of the following are counted amongst the commonly known postural deformities?

(a) Spinal curvature

(b) Flat foot

(c) Bow legs

(d) All of these

Ans. (d) All of these

6. Running on an uneven terrain can cause .....

(a) lordosis. (b) kyphosis.

(c) scoliosis. (d) none of these.

Ans. (c) scoliosis.

7. Which yogic poses help in correcting round shoulders?

(a) Bhujangasana and Ustrasana

(b) Gomukhasana and Padmasana

(c) Ardh Matsyendrasana and Garudasana

(d) Chakrasana and Dhanurasana

Ans. (a) Bhujangasana and Ustrasana

8. In which postural deformity is there an abnormal lateral curvature of the spine?

(a) Kyphosis (b) Lordosis

(c) Fibrosis (d) Scoliosis

Ans. (d) Scoliosis

9. What is the name of the postural deformity caused due to increase in the curve at the lumbar region? **(CBSE SP 2021 Term 1)**

(a) Knock knees (b) Bow legs

(c) Kyphosis (d) Lordosis

Ans. (c) Kyphosis

10. Which postural deformity has convexities right or left? **(CBSE SP 2021 Term 1)**

(a) Flat foot (b) Knock knees

(c) Kyphosis (d) Scoliosis

Ans. (d) Scoliosis

11. Which postural deformity is related to posterior curve of the spine? **(CBSE SP 2021 Term 1)**

(a) Scoliosis (b) Kyphosis

(c) Lordosis (d) Knock knees

Ans. (b) Kyphosis

12. Which exercise should be done to cure this deformity? **(CBSE SP 2021 Term 1)**

(a) Skipping

(b) Walking on heels

(c) Both (a) and (b)

(d) Hanging on horizontal bar

Ans. (c) Both (a) and (b

13. Scoliosis is a postural deformity related with .....

(a) foot.

(b) leg.

(c) vertebral column.

(d) hand. **(CBSE 2020)**

Ans. (c) vertebral column.

14. Menarche is defined as the .....

(a) ending of menstrual period in women.

(b) beginning of menstrual period in women.

(c) time of pregnancy.

(d) beginning of pregnancy. **(CBSE 2020)**

Ans. (b) beginning of menstrual period in women.

15. Which of the following is not a female athlete triad? **(CBSE 2020)**

(a) Amenorrhoea (b) Eating disorder
(c) Obesity (d) Osteoporosis

Ans. (c) Obesity

16. Amenorrhoea, dysmenorrhoea and menorrhogia are the types of .....

(a) menarche.
(b) menstrual dysfunctions.
(c) osteoporosis.
(d) anorexia nervosa.

Ans. (b) menstrual dysfunctions.

17. If the menstrual periods go more than ..... days, it is oligomenorrhoea.

(a) 15 (b) 25
(c) 35 (d) 45

Ans. (c) 35

18. Weakening of bones due to loss of bone density and improper bone formation is known as .....

(CBSE SP 2022)

(a) amenorrhoea. (b) anorexia nervosa.
(c) osteoporosis. (d) lordosis.

Ans. (c) osteoporosis.

19. Which of these is an eating disorder in which patients have an obsessive fear of gaining weight?

(a) Bulimia (b) Amenorrhoea
(c) Leukaemia (d) Anorexia

Ans. (d) Anorexia

II. Match the following:

1.

List I (Postural Deformities)		**List II (Causes)**	
(i)	Scoliosis	(1)	Long distance running
(ii)	Lordosis	(2)	Lack of phosphorus
(iii)	Flat foot	(3)	Obesity
(iv)	Knock knee	(4)	Uncomfortable shoes

Select the correct set of options:

(a) (i)–(3), (ii)–(4), (iii)–(2), (iv)–(1)
(b) (i)–(2), (ii)–(4), (iii)–(1), (iv)–(3)
(c) (i)–(1), (ii)–(3), (iii)–(4), (iv)–(2)
(d) (i)–(4), (ii)–(3), (iii)–(2), (iv)–(1)

Ans. (c) (i)–(1), (ii)–(3), (iii)–(4), (iv)–(2)

2.

List I – Asanas		**List II – Postural Deformity**	
(i)	Garudasana	(1)	Round shoulder
(ii)	Gomukhasana	(2)	Lordosis
(iii)	Chakrasana	(3)	Bow legs
(iv)	Naukasana	(4)	Knock knees

Select the correct set of options:

(a) (i)–(3), (ii)–(4), (iii)–(1), (iv)–(2)
(b) (i)–(1), (ii)–(3), (iii)–(4), (iv)–(2)
(c) (i)–(4), (ii)–(2), (iii)–(1), (iv)–(3)
(d) (i)–(2), (ii)–(3), (iii)–(4), (iv)–(1)

Ans. (a) (i)–(3), (ii)–(4), (iii)–(1), (iv)–(2)

3.

List I – Postural Deformities		**List II – Corrective measure** **(CBSE SP 2021 Term 1)**	
(i)		(1)	
(ii)		(2)	
(iii)		(3)	
(iv)		(4)	

Select the correct set of options:

(a) (i)–(1), (ii)–(3), (iii)–(2), (iv)–(4)
(b) (i)–(1), (ii)–(4), (iii)–(3), (iv)–(2)
(c) (i)–(1), (ii)–(3), (iii)–(4), (iv)–(2)
(d) (i)–(4), (ii)–(2), (iii)–(3), (iv)–(1)

Ans. (b) (i)–(1), (ii)–(4), (iii)–(3), (iv)–(2)

III. Assertion-Reason Type Questions: CBQ

Given below are the two statements labelled Assertion (A) and Reason (R).

1. A: Lordosis is the excessive inward curvature of spine in the lower back.

R: Halasana and toe touching exercises are helpful in correcting lordosis.

2. A: Physical activities as corrective measure are very effective in functional deformity in comparison to structural deformity.

R: Muscles and ligaments are affected in functional deformity. **(CBSE SP 2021 Term 1)**

In the context of the two statements given above, which one of the following is correct?

(a) Both (A) and (R) are true and (R) is the correct explanation of (A).

(b) Both (A) and (R) are true but (R) is not the correct explanation of (A).

(c) (A) is true, but (R) is false.

(d) (A) is false, but (R) is true.

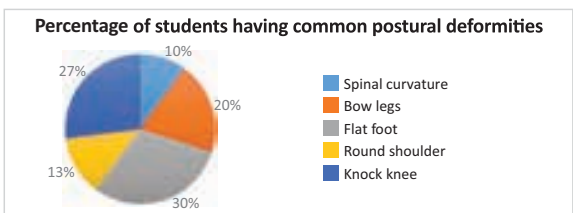
Ans. 1. (a) Both (A) and (R) are true and (R) is the correct explanation of (A).

2. (a) Both (A) and (R) are true and (R) is the correct explanation of (A).

IV. Data-Based Questions: CBQ

A total of 1,000 students were clinically screened for physical deformities in order to identify and classify the various forms of physical deformities. Ninety of the students were identified with various physical deformities.

Given below is the chart which depicts the percentage of students having common postural deformities.



On the basis of the given pie-chart, answer the following questions:

1. How many students are with physical deformity bow legs?

(a) 30 (b) 18

(c) 9 (d) 24

2. Which of the following is not a spinal curvature deformity?

(a) Kyphosis (b) Scoliosis

(c) Lordosis (d) Flat foot

3. Which postural deformities is least in number as per the given data?

(a) Round shoulder (b) Knock knee

(c) Spinal curvature (d) Bow legs

Ans. 1. (b) 18 2. (d) Flat foot

3. (c) Spinal curvature

V. Picture-Based Questions: CBQ

Identify the following asana and write the name of the postural deformity that it is helpful in treating:

1. 

.....

2. 

.....

3. 

.....

4. 

.....

Ans. 1. Dhanurasana – Kyphosis; 2. Halasana – Lordosis; 3. Padmasana – Knock Knee; 4. Trikonasana – Scoliosis

VI. Case-Based Questions: CBQ

1. Sandy is diagnosed with postural adaptation of the spine in lateral direction. The curve is identified as convexity right. It happened due to Sandy's underdeveloped legs and carrying heavy loads on one side only.

(CBSE SP 2021 Term 1)

What kind of postural deformity doctors found in Sandy?

(a) Scoliosis (b) Kyphosis

(c) Bow Legs (d) Flat foot

Ans. (a) Scoliosis

2. Posture plays a very significant role in our daily activities. Correct posture means the balancing of the body in an accurate and proper manner. Various types of postural deformities can be identified in individuals. **(CBSE SP 2021 Term 1)**

From the following picture, the deformities seen on the left most is caused due to deficiency of which nutrient?

(a) Iron (b) Calcium

(c) Vitamin D (d) Both (b) and (c)

Ans. (d) Both (b) and (c)

3. A female athlete has an abnormal eating behaviour and suffers from Anorexia Nervosa. On the basis of the case given, answer the following questions:

(a) What could possibly be a reason behind the behaviour?

(b) Which symptoms confirm Anorexia Nervosa?

(c) _____ can possibly help the athlete manage her condition.

(d) Anorexia Nervosa comprises _____ type of Anorexia and _____ type of Anorexia.

Ans. (a) Massive weight lossz

(b) Fatigue and insomnia

(c) Psychotherapy

(d) restricting, purging

4. In relation to the picture, answer the following questions.

(a) Which deformity is shown here?

(b) Mention two factors that lead to this condition.

(c) ____ people mostly suffer from this condition.

(d) Doing _____ (yoga asana) can correct this condition.

OR

Mention two precautionary measures for preventing this condition.

Ans. (a) Lordosis

(b) Imbalanced diet, obesity

(c) Obese

(d) Halasana

OR

Two precautionary measures:

(a) Good nutrition will help in controlling pain, disability and will keep spine healthy. Therefore, a well balanced diet must be taken.

(b) While carrying a heavy load, the person has to lean forward which results in a bad posture. Even if carrying weight, one should align her/his body in straight position.

B. Very Short Answer Type Questions

1. Define posture.

Ans. Posture can be defined as synchronising body movement which allows a quick and easy transition into the next relevant movement.

2. What do you mean by knock knee? **(CBSE 2011)**

Ans. Knock knee is a condition of postural deformity where the knees knock or rub together while walking or standing and the feet and ankles are far apart than normal.

3. What are the negative impacts of incorrect postures on a person's mental health?

Ans. Incorrect postures can have negative impacts on a person's mental health by causing physical discomfort, pain and fatigue, which can lead to decreased motivation and energy levels, lower mood, and increased stress levels. Additionally, poor posture can affect one's self-esteem and body image, leading to negative thoughts and emotions.

4. State the common postural deformities.

(CBSE 2017)

Ans. The common postural deformities are:

- Spinal curvature
- Flat Foot
- Knock Knees
- Bow Legs
- Round Shoulder.

5. What is scoliosis? **(CBSE 2011)**

Ans. Scoliosis is the abnormal lateral curvature of the spine. It can be bending, twisting or rotating of the spine.

6. What is the main cause of scoliosis?

(CBSE 2012, 2018)

Ans. The main causes of scoliosis are diseases in the joints of bones, polio, rickets, infantile paralysis, cerebral palsy and juvenile osteoporosis or

other diseases. These conditions are also often associated with poor posture, partial deafness and carrying heavy loads on one shoulder.

7. What is 'an abnormal curvature of spine at front' termed as? **(CBSE 2015)**

Ans. An abnormal curvature of spine at front is termed as lordosis.

8. Suggest any two free hand exercises for correcting round shoulder. **(CBSE 2015)**

Ans. The two free hand exercises for correcting round shoulder are:

- Place both tips of fingers on the shoulders and start encircling the elbows in a clockwise and anticlockwise direction.
- Hang on the horizontal bar for some time.

9. Suggest any two exercises for correcting flat foot. **(CBSE 2016)**

Ans. The two exercises for correcting flat foot are:

- Walking on the lateral border of the foot.
- Heel walking involves walking on the heels with whole body weight on the heels.

10. Name the deformity for which horse riding can be used as corrective measure. **(CBSE SP 2016)**

Ans. The deformity for which horse riding can be used as a corrective measure is knock knee deformity. It would help naturally in making a gap between the knees.

C. Short Answer Type-I Questions

1. What are the advantages of correct posture? **(CBSE 2011, 2012, SP 2015)**

Ans. Correct posture has numerous advantages, including reducing strain on muscles and joints, improving breathing and digestion, promoting better circulation and overall physical health. It also helps to prevent injuries and reduces the risk of developing chronic pain conditions. Proper alignment of the spine and other body parts can enhance balance, coordination, and overall athletic performance, and can even boost self-confidence and mental health by promoting positive body image and reducing stress levels.

2. How do good postures affect an individual's personality?

Ans. Good postures can positively affect an individual's personality by promoting confidence, self-esteem, and a positive body image. People who maintain good posture appear taller, more alert, and more attentive, which can create a more positive impression on others. Good posture can also enhance the way an individual carries themselves, giving off an air of poise and self-assurance. Overall, good posture can help to project a more confident, competent, and attractive personality to the world.

3. Briefly discuss any four causes of bad postures.

Ans. There are various causes of bad posture. They are as follows:

i. **Poor Diet:** A diet that lacks in sufficient amounts of nutrients is a common cause of bad posture. Our bones and muscles are weakened when we do not supply them with the nutrition they require on a daily basis. This leads to adopting incorrect postures.

ii. **Birth Defects:** In some cases, bad postures are a product of birth defects. Club and dislocation of hips are two examples.

iii. **Diseases:** Rickets, polio, infantile paralysis and chronic illnesses which have an impact on vertebral curvature are other common sources of bad postures.

iv. **Accidents:** Serious injuries from accidents can also lead to further physical deformity if the muscles and joints are permanently damaged.

4. What are some of the common postural deformities?

Ans. Some of the commonly known postural deformities are given below:

i. Spinal Curvature

ii. Flat Foot

iii. Knock Knees

iv. Bow Legs

v. Round Shoulder

5. What are the types of physical deformities related to spine?

Ans. There are several types of physical deformities related to the spine, including scoliosis (abnormal sideways curvature), kyphosis (rounded upper back) and lordosis (swayback or excessive inward curvature of the lower back). These conditions can affect posture, mobility, and overall physical health and wellbeing, and may require medical intervention or physical therapy to manage.

6. What is the main cause of bow legs?

Ans. Bow legs – a condition where the legs appear to curve outwards. Rickets is one of the main causes of bow legs. Children with rickets do not get enough calcium, phosphorus and vitamin D all of which are vital for healthy growth of bones.

7. Which yogic poses are recommended to cure round shoulders?

Ans. Several yogic poses can help correct rounded shoulders, including:

- Ustrasana
- Chakrasana
- Dhanurasana
- Bhujangasana

These poses help to stretch and strengthen the muscles of the upper back, chest, and shoulders, improving posture and reducing pain and discomfort associated with rounded shoulders. It is recommended to practice these poses under the guidance of a qualified yoga instructor.

8. What is premenstrual syndrome?

Ans. Experiencing symptoms like, pain in the back legs or abdomen, acne, irritability, mood swings, water retention, tender breasts, headaches, constipation, depression or emotional stress, etc. before the onset of menstrual periods is called premenstrual syndrome. A female may have one or more symptoms a few days before her periods.

9. List the revised terms to describe the female athlete triad.

Ans. The revised terms to describe the female athlete triad are

i. Low energy availability with or without eating disorder

ii. Dysfunction of menstruation

iii. Low bone density.

10. What kind of diet should a woman athlete suffering from osteoporosis take? Why?

Ans. A woman athlete suffering from osteoporosis should consume a diet rich in calcium, vitamin D, and other bone-healthy nutrients to support bone health and prevent further bone loss. This may include calcium-rich foods such as dairy products, leafy greens and fortified foods, as well as vitamin D-rich foods such as fatty fish, eggs and mushrooms. It is also important to consume adequate protein, which is essential for bone and muscle health. In some cases, a calcium or vitamin D supplement may be necessary to meet recommended daily intake levels.

11. What are the major eating disorders?

Ans. The major eating disorders include anorexia nervosa, bulimia nervosa and binge eating disorder. Anorexia nervosa is characterised by a distorted body image and an extreme fear of gaining weight, leading to severe calorie restriction and weight loss. Bulimia nervosa involves cycles of binge eating followed by purging behaviors such as vomiting or excessive exercise. Binge eating disorder involves consuming large amounts of food in a short period of time, often accompanied by feelings of shame and guilt.

D. Short Answer Type-II Questions

1. What is the correct posture of standing?

Ans. The correct posture for standing involves maintaining a neutral spine, with the ears, shoulders, hips, and ankles aligned vertically. The feet should be shoulder-width apart, with the weight evenly distributed between both feet. The knees should be slightly bent, and the abdominal muscles engaged to support the lower back. The shoulders should be relaxed, and the chin parallel to the ground. The gaze should be straight ahead, and the arms should hang naturally at the sides.

2. What is the correct posture of sitting?

Ans. The correct posture for sitting involves keeping the feet flat on the ground, with the knees at a 90-degree angle and the hips level with or higher than the knees. The back should be straight, with the shoulders relaxed and the chin parallel to the ground. The arms should rest comfortably on armrests or the desk, and the computer screen should be at eye level. It is important to take breaks and stand up and stretch periodically to avoid prolonged sitting.

3. Write any four advantages of correct posture.

Ans. Four advantages of correct posture are as follows:

i. Boosting Self-confidence: Proper posture can help you make a good impression and appear more attractive and confident. You look taller, slimmer and more successful when you sit and stand upright.

ii. Production of Graceful and Efficient Movements: Mobility and stability are important for efficiency of movements. The combination of muscle elasticity and range of motion of joint constitutes mobility while the ability to maintain posture and control movements freely comprises stability.

iii. Physical Fitness: Muscular strength, endurance, agility, balance flexibility, coordination and power are the components of physical fitness. Physical fitness can be

achieved through a combination of daily physical activity, exercise and a healthy diet. These can be accomplished by any individual who follows correct posture regimes.

iv. **Sociability:** Graceful movement and an upright position are means of representing your genteel outlook symbolising self-discipline, moral fortitude and dignity. It contributes to shaping a friendly and strong personality, which in turn helps you maintain a successful social life.

4. How can the postural deformities be corrected?

Ans. Postural deformities can be corrected through a combination of exercises, stretches and physical therapy. A physical therapist can work with an individual to develop a personalised plan to address their specific postural issues, including strengthening weak muscles, stretching tight muscles, and improving overall flexibility and mobility. Additionally, some adjustments to the workplace or home environment may be necessary, such as adjusting the height of a desk or chair to promote proper alignment. In some cases, medical devices may be necessary to support proper alignment and facilitate healing.

5. Write about the deformities of spinal curvature. **(CBSE 2016)**

Ans. The lumber spine is characterised by a moderate anterior hyperextension curve, i.e. everybody's spine has some form of curvature. Spinal curve helps our backs absorb shock. A healthy spine should run however straight down the centre. Sometimes, abnormal spinal curvatures are formed. They are associated with the abnormality in the formation, alignment or shape of the vertebral column or spine. These deformities are the result of carrying excessive weight beyond capacity of the body. We have three types of spinal curvatures:

- Kyphosis
- Lordosis
- Scoliosis

6. Enlist the spinal postural deformities. Explain the cause of kyphosis and precautions to avoid it. **(CBSE SP 2016)**

Ans. The list of spinal posture deformities are:

- Kyphosis
- Lordosis
- Scoliosis

Causes of kyphosis: Kyphosis is caused by malnutrition, illness, deficiency of pure air, insufficient exercises, rickets, carrying heavy loads, poorly shaped furniture, weak muscles, ageing, spinal injury, arthritis and other degenerative bone diseases and the habit of doing work by leaning forward.

Precautions: It can be prevented by following correct posture while sitting, standing and walking from an early age. Proper exercise and diet are also important measures.

7. Briefly explain lordosis, its causes and remedial and preventive measures.

Ans. Lordosis is the excessive inward curvature of spine resulting in a forward curve in the lumber region. The body becomes stiff and painful.

Causes: It can be caused because of imbalanced diet, improper environment, improper development of muscles, obesity and diseases affecting vertebrae and spinal muscles like spondylitis and osteoporosis. Physical inactivity and excessive intake of food are also the major causes.

Precautions: The following are the precautionary and remedial measures:

- Good nutrition
- By weight control especially at an early age.
- While carrying a heavy load, the person has to lean forward which results in a bad posture. Even if carrying weight one should align her/ his body in straight position.
- Stand straight with the feet and shoulder width apart.
- Bend your knee and hold your ankle. When you pull your back, tilt your pelvis forward. Hold this position for 25-30 seconds.
- Lie down on the floor facing the ceiling and put your feet on the floor; tilt your pelvic back by pushing the lower back into the floor. Lift your torso off the floor to 30° angle by supporting your neck with your hands. Come back slowly to starting position and repeat exercises 10 times.
- Lie down your back on the floor facing upward with the flexion of knees while keeping your feet flat on the floor apart from each other. Squeeze your gluteus and lift up your hip upward as much as you can. Hold for 20 to 30 seconds and return to starting position. Repeat this exercise 20 times a day.
- Toe touching exercises, sit up and halasana should be performed regularly.

- For performing head to knee exercises, remain seated on the mat with your legs stretched forward. Slowly, lower your head and try to touch your forehead to your knees. Hold to count of 10 and repeat it for 10 to 15 times.

8. Briefly explain scoliosis, its causes and preventive and remedial measures.

Ans. Scoliosis is the abnormal lateral curvature of the spine. It can be bending, twisting or rotating of the spine. People with scoliosis develop additional sideways curves on either side of the body and may be called scoliotic curves. These curves are defined in terms of their convexities and identified as right convexities and left convexities.

Primary causes: The primary causes are diseases in the joints of bones, polio, rickets, infantile paralysis, cerebral palsy and juvenile osteoporosis or other diseases.

Precautionary measures:

- An unhealthy diet and low levels of specific minerals can contribute to scoliosis progression.
- Carrying heavy things especially on one side should be avoided as it adds to natural pull of gravity and compresses the spine further.
- Long distance running on uneven terrain and prolonged running can result spinal compression, may bend or rotate your curve and cause greater risk of scoliosis progression. Thus, running should be limited.

Remedies:

- Lie down facing the ground, bend your elbow, and support your body with your toes. Squeeze your abs in and hold this position for 5 seconds. Repeat technique step 10 times.
- Scoliosis can be cured by breast stroke or butterfly technique of swimming.
- Yoga has been one of the best practices to cure any ailment and also helps in enhancing overall physical strength. It maintains a balance for the body in case of scoliosis.
- Use a firm quality mattress. Avoid the soft mattresses and use extra pillows for comfort instead.
- Sitting or standing in one place for prolonged period stresses the spine. Stretch or take a walk as often as possible. Choose a chair with good support if you sit for extended period.
- For mild scoliosis football is another great exercise that can strengthen the core muscle. All positions except goalkeeper are fine.

9. Briefly explain flat foot, its causes and preventive and remedial measures.

Ans. The appearance of flat foot is natural and common in infants. Flat foot in children usually disappears when they attain adolescence and adulthood. Persisting during the later periods of childhood becomes a postural deformity. A child with a flat foot cannot become an efficient sportsperson. They feel pain mainly in the heel area and experience difficulty in standing and walking.

Causes: It usually develops due to excessive stress on the feet. Weak muscles in feet, ankles and lower leg cannot bear body weight. Conditions related to ageing such as weakness of muscles and bones, uncomfortable shoes, foot injuries and carrying heavy loads for longer period also cause flat foot.

Precautions:

- Wearing comfortable shoes that fully support the arch and help stabilise the heel.
- Walking bare feet should be avoided.
- Losing excess weight can reduce the stress on feet.
- Infants or toddlers should not be compelled to walk at very early stage.
- Carrying heavy loads should be avoided at the early stage of development.
- High-heeled shoes should be avoided.

Remedial measures:

The exercises like walking on the toes, walking on the lateral border of the foot, making the fist with the foot relaxing them and then repeating it again, skipping on a rope, the vajrasana yogic asana and heel walking involves walking on the heels with the whole body weight on the heels.

10. Briefly explain knock knee, its causes and preventive and remedial measures.

Ans. The scientific name of knock knee is *genu valgum*. The term originates from the Latin word '*genu*' which means '*knee*' and '*valgus*' which means 'bent outside'. It is a condition of postural deformity where the knees knock or rub together while walking or standing and the feet and ankles are fat apart than normal. One having this problem faces problems in walking and running.

Causes:

- Lack of vitamin D and minerals like calcium and phosphorus.
- Problems associated with the development of bones and joints like rickets, osteoporosis and arthritis also contribute to knock knee.
- Other possible factors include obesity, flat foot, an injury or infection affecting the knees or leg bones and carrying a heavy load at an early age.

Precautions and remedies:

- Daily cycling for 20 to 30 minutes and horse riding would help naturally in making a gap between the knees.
- Keep a pillow between the legs while sleeping, walking or sitting daily for 15 to 20 minutes.
- Knock knees' special shoes, night braces and walking calipers may prevent knocking.
- Perform the padmasana and gomukhasana yogic poses daily.
- Supplement of vitamins D like cod liver oil and minerals like calcium and phosphorus should be taken for strengthening the bones.

11. Briefly explain bow legs, its causes and preventive and remedial measures.

Ans. Bow leg is simply a normal variation in leg appearance. It is a condition of physical deformity marked by an outward bowing of the leg, i.e. knees are wide apart and ankles are touching. There is a distinct space between lower legs and knees which is opposite to knock knees. When standing with feet together, the individual legs appear like an archer's bow. It may be on either side or both legs curving outward. Bowed legs are most apparent while walking, running and standing.

Causes: Rickets is the main cause of bow legs. Children with rickets do not get enough calcium, phosphorus and vitamin D all of which are vital for healthy growing of bones.

Precautions and remedies:

- Never force babies to walk at a very tender age.
- Appropriate body weight with respect to ages should be maintained.
- A balanced diet is essential for the timely growth and maintenance.
- Vitamin D should be taken in a recommended amount.
- Intake of well balanced diet is crucial for overall development and functioning of body.
- Some special shoes, casts and leg braces can be used for correcting bow legs in young children.
- Bow-legged person should try to walk for some distance on the inner edge of the feet.
- In-toeing position of walking where feet turn inward instead of pointing straight should be adopted.

12. What do you mean by round shoulders? Suggest any four physical activities for correcting round shoulders. **(CBSE 2015)**

Ans. This postural abnormality is characterised by a drooping shoulder which appears round and a slight forward bending of the back.

Causes: There are many factors which promote development of rounded shoulders:

- Heredity factors led to rounded shoulders.
- Tight clothing and shoes affect posture.
- High-heeled shoes, tight fitting clothes, wide belt, etc. change the centre of gravity which ultimately leads to poor posture.
- Poor posture of sitting, standing and walking, improper furniture, excessive weight training like bench press, bicep curls and shoulders press exercises result in rounded shoulders.
- Complete lack of exercises which are concerned with shoulders also affects the shoulders, leaving them vulnerable to rounded shoulder.

Precautions and remedies:

- Never slouch while sitting and walking and always stand flat back position.
- Those who have rounded shoulders should not wear tight fitting clothes and avoid high heeled shoes.
- Avoid sitting on faulty furniture which is not comfortable.
- Place the tips of fingers of both hands on shoulders and encircle the elbows in a clockwise and anticlockwise direction.
- Hang on the horizontal bar for some time.
- Perform yogic techniques especially chakrasana and dhanurasana on a regular basis.

13. Suggest at least two exercise methods for treating (a) lordosis, (b) round shoulder, (c) flat

feet, (d) scoliosis, (e) kyphosis, (f) knock knee, and (g) bow legs.

Ans. (a) **Lordosis:**

- First lie down in a prone position with hands under abdomen. Then keep hips and shoulder down and gently press hands upon abdomen and raise the lower back.
- Bend knees forward while allowing hips to bend back behind. Keeping the back straight and knees pointed in the same direction as feet, lower your body until thighs are parallel to floor. Extend the same from the starting position.

(b) **Round shoulder:**

- Place the tips of fingers of both hands on shoulders and encircle the elbows in a clockwise and anticlockwise direction.
- Hang on the horizontal bar for some time.

(c) **Flat feet:**

- Practise jumping on toes for some time.
- Rope skipping exercise.

(d) **Scoliosis:**

- Lie down in prone position. Raise right arm upward and left arm at the side. After this position, bring right arm towards the left over the head, by pressing down with left hand and then slide the left hip up.
- Stand erect with feet few inches apart. Lift up the left and hip. Extend the right arm and bend the arm towards the left over head while pressing the left side of rib by the left hand.

(e) **Kyphosis:**

- Lie down in a prone position with hands on hips. After that raise your head and chest several inches from the ground and tuck your chin during this exercise. Hold this position for some time and return to previous position. Repeat this exercise at least 10 times.
- Sit in a normal position with a stick held in horizontal position over the head and trunk, hands well stretched. After that lower the stick and then raise it behind head and shoulders. Repeat this exercise 10 to 12 times.

(f) **Knock knee:**

- Daily cycling for 20 to 30 minutes and horse riding would help naturally in making a gap between the knees.
- Perform the padmasana and gomukhasana daily that may counteract the effects of knock knee.

(g) **Bow legs:**

- Bow-legged persons should try to walk for some distance on the inner edge of the feet.
- Do yogic exercises like garudasana and ardha matsyendrasana regularly.

14. How does intensive exercise impact menarche?

Ans. It has been found that intensive exercise and sports activities can cause abnormalities, like delayed menarche and amenorrhoea. Such activities create physiological stress which affects the reproductive process and disrupts the normal patterns. It is true that menstrual abnormalities or other health issues are frequent among women who are involved in intensive exercises and sports activities.

15. Write briefly about menstrual dysfunctions and their effect on sports participation of female athletes. **(CBSE 2018)**

Ans. **Menstrual Dysfunction**

The average menstrual cycle consists of 21–35 days and menstrual bleeding or periods occur during the first 2–7 days of the cycle. Each cycle ends on the first day of the next menstrual bleeding. Any abnormality or irregularity in this process is termed as menstrual dysfunction. It is reported that about 9 – 30% of women suffer from menstrual dysfunction of one form or the other. Some common types of menstrual dysfunction are listed below:

Amenorrhoea

A case of delayed menarche or a case of absence of menstrual period for 6 months or more after the last period is called amenorrhoea. Sometimes, it may be absent for years.

Dysmenorrhoea

A menstrual period accompanied by sharp pain or cramps in the lower abdomen and pelvic area is called dysmenorrhoea or painful menstruation. During menstruation, the muscles of the uterus contract due to release of molecular compounds called prostaglandins and other inflammatory mediators.

Premenstrual Syndrome

Experiencing symptoms like, pain in the back legs or abdomen, acne, irritability, mood swings, water retention, tender breasts, headaches, constipation, depression or emotional stress, etc. before the onset of menstrual periods is called premenstrual syndrome. A female may have one or more symptoms a few days before her periods.

Menorrhagia or Heavy Periods

Normally the menstrual flow is heavy at first and then gradually decreases. But increased and heavy flow at regular intervals or a loss of more than 80 mL of blood during each menstrual bleeding indicates menorrhagia or heavy periods.

Irregular Periods

Mostly, menstrual cycles form a regular pattern of every 21–35 days after 1–3 years from the first bleeding or menarche. For some females, periods might skip altogether for months or come earlier than expected.

Prolonged Periods

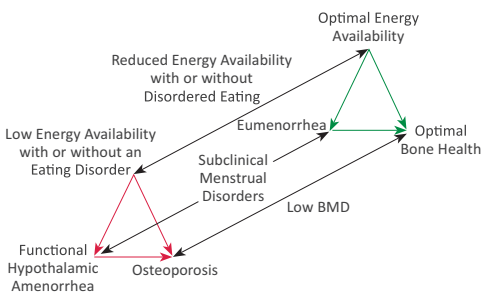
On an average, the menstrual bleeding or periods lasts about 2–7 days. Prolonged periods are longer than this duration and occur at unpredictable intervals.

Delay in Menarche

The average age of menarche in a female ranges from 12–14 years. If it is later than 14 years and above, it is a case of delayed menarche, which is also termed as primary amenorrhoea. At times, it may be as late as in 18 years of age or more.

16. Create a mind map describing female athletes triad and its causes.

Ans.



17. What is the meaning of female athletes triad? Explain any two in brief. **(CBSE SP 2022)**

Ans. It is a serious disorder of three interrelated medical conditions; energy deficiency with or without eating disorders; menstrual disturbances; and reduced bone mineral density which is likely to cause osteoporosis. The triad usually affects teenage girls who consume less calories and exercise excessively. They may develop eating disorders and become obsessed with exercise to achieve low body weight and enhance and performance in sports. Therefore, they are at greater risk of suffering from this syndrome. Energy deficiency leads to menstrual disturbances like amenorrhoea which is associated with low oestrogen levels. Low oestrogen levels contribute to a decrease in bone density and lack of calcium and vitamin D in the body. This is one of the main causes of osteoporosis. A women is likely to have the other two conditions if she is suffering from one condition of the triad

Amenorrhoea: A case of delayed menarche or a case of absence of menstrual period for 6 months or more after the last period is called amenorrhoea. Sometimes, it may be absent for years.

Osteoporosis: The National Institutes of Health (USA) defines osteoporosis as "a skeletal disorder characterised by compromised bone strength predisposing a person to an increased risk of fracture". It is a condition in which the density and strength of the bone is reduced, making it vulnerable to frequent fractures, like, stress fracture and other bone injuries. This is why osteoporosis is fatal to female athletes and their athletic careers.

18. What are the causes of osteoporosis? **(CBSE 2019)**

Ans. Osteoporosis can be caused due to:

- **Calcium Deficiency:** Calcium is a key component is building the density and strength of bones. The recommended daily requirement of calcium is 1000-1500 mg. Insufficient calcium in the body can have lifelong consequences for bones. Insufficient amount of calcium in the body causes other organs such as heart, muscles, nerves, etc. to use up the calcium stored in the bones. This results in depletion of calcium in the bones, decreasing their density and hardness, therefore causing osteoporosis.
- **Amenorrhoea:** Our bones are constantly braking down and rebuilding again to maintain their structure and strength. Oestrogen is essential to keep a balance between the two and helps absorption of calcium. Since women suffering from amenorrhoea have decreased oestrogen level in the body, it also disrupts the remodelling process in bones. Formation of abnormal bone structure and loss of calcium deposit takes place. Bones become weak, porous and prone to fractures. Therefore amenorrhoea can also cause osteoporosis.

19. Briefly explain eating disorders and classify them.

Ans. Eating disorders are a range of psychological disorders in which a person's eating behaviour

is abnormal. It may include inadequate or excessive food intake which can ultimately harm an individual's well-being. It is commonly exhibited along with conditions such as anxiety, depression and other addictive or self-destructive behaviours. It can be either Anorexia Nervosa or Bulimia Nervosa.

(a) Anorexia Nervosa is an eating disorder in which the patients have an obsessive fear of gaining weight.

(b) Bulimia Nervosa is an eating disorder in which the patient consumes a large quantity of food within a short period and subsequently ejects it from the body through vomiting, or with the help of laxatives or diuretics.

20. Explain the meaning of anorexia nervosa and cite its types.

Ans. It is an eating disorder in which the patients have an obsessive fear of gaining weight. They have an unrealistic fear of gaining weight. They have an unrealistic perception of body image and view themselves as overweight even when they are clearly underweight. It usually begins during the teens and is more common in women than men. It may become a lifelong disease without intervention at the initial stage. This disorder can have damaging health consequences such as heart problems, brain damage, multiple organ failure, osteoporosis and infertility. It should, however, be noted that anorexia nervosa does not necessarily mean loss of appetite. The patient can retain their appetite and suppress it systematically. It is of two types:

- Restricting type: In this form, consumption of food is severely restricted in various ways like maintaining a calorie count that is too low for the body's requirement. The patient reduces her/his weight effectively through obsessive rules like drastic exercising.
- Purging/Binge eating type: In this type, the restriction of food intake is accompanied by binge-eating and purging phases.

21. Explain briefly about eating disorder bulimia.

(CBSE 2019)

Ans. Bulimia nervosa or simply bulimia, is an eating disorder in which the patient consumes a large quantity of food within a short period and subsequently ejects it from the body through vomiting, or with the help of laxatives or diuretics. The term 'bulimia' means 'the ravenous hunger of an fox', a reference to the voracious appetite of the patient. When a person suffers from bulimia, she/he is under the grip of a hunger that that is induced by psychological reasons, physiological ones.

22. Explain the meaning of bulimia nervosa.

Ans. Bulimia nervosa or simply bulimia, is an eating disorder in which the patient consumes a large quantity of food within a short period and subsequently ejects it from the body through vomiting, or with the help of laxatives or diuretics. It has two types like:

- Purging Bulimia: In this type of bulimia, the patient undergoes self-induced vomiting or abuses diuretics, laxatives or enemas. The aim is to remove food from the body before it gets digested and deposited.
- Non-purging Bulimia: In this type of bulimia the individual uses methods like fasting, strict dieting or excessive exercising to get rid of the calories and to prevent weight gain.

E. Long Answer Type Questions

1. What do you mean by correct posture? Explain the standing and sitting postures.

Ans. Correct posture refers to the alignment of the body in a way that minimizes stress on muscles and joints. It involves maintaining a balance between the different body parts while standing, sitting, or lying down.

When standing, correct posture involves keeping the feet shoulder-width apart with weight distributed evenly on both feet. The shoulders should be relaxed, the chest lifted, and the chin parallel to the ground. The knees should be slightly bent and the abdominal muscles engaged to support the spine.

When sitting, correct posture involves sitting with the hips all the way back in the chair with both feet flat on the ground. The back should be straight with the shoulders relaxed, and the head aligned with the spine. The arms should rest comfortably on the armrests, and the knees should be at a 90-degree angle.

Maintaining correct posture is important to prevent pain and injury and promote overall health and well-being.

2. What are the causes of bad posture?

(CBSE 2015, 2017)

Ans. The causes of bad postures are as follows:

i. Fatigue: Sitting at the office for long hours at the end can cause damage to the spine.

ii. **Ill-fitting Clothes and Shoes:** When you wear tight clothes, the nervous system configures posture based on information received from the skin and other involved parts of the body; this may lead to the body as a whole adopting positions that are not good for the skeletal structure. Pointed heels should only be worn occasionally and not as a rule as they can cause sore calf muscles and varicose veins.

iii. **Lack of Proper Exercise:** Regular exercise promotes utilisation of muscles and bones so that they remain strong. Meanwhile, inactivity leads to the adoption of a poor posture. Improper exercises can also be damaging to the vertebral structure.

iv. **Poorly Designed Furniture:** The furniture we use shape our posture to a large degree. Too soft mattresses and chairs that do not let the back assume its normal curve are culprits behind formation of bad postures The bench and desks in the school should be of ideal height that the students can use them without putting pressure on their backs and shoulders.

v. **Carrying Heavy Load:** Carrying a heavy load, such as a weighty school backpack, puts additional stress on the spine. It can alter the posture of the person and increase postural sway. The load should be within 10% of the individual's body weight.

vi. **Obesity:** Excess weight never has positive impacts on the body. Lordosis is caused by excess abdominal weight. Obesity can further result in flat foot, bow legs and knock knee. A healthy weight helps in maintenance of a neutral posture and balanced spine.

3. Explain any five postural deformities. **(CBSE 2012)**

Ans. Any five postural deformities are as follows:

i. **Kyphosis:** This is a postural deformity characterised by an excessive forward curvature of the upper back, resulting in a rounded or hunched-over appearance. It can be caused by poor posture, osteoporosis or spinal fractures.

ii. **Lordosis:** This is an inward curvature of the lower back that results in a swayback appearance. It is commonly caused by poor posture or excessive weight on the abdomen, such as during pregnancy or obesity.

iii. **Scoliosis:** This is a lateral curvature of the spine, which can be either C-shaped or S-shaped. It often develops during childhood or adolescence, and can be caused by genetic factors or poor posture.

iv. **Round shoulders:** This postural deformity is characterised by a forward rounding of the shoulders, which can lead to a hunchback appearance. It can be caused by poor posture, weak back muscles, or spending too much time hunched over a computer or phone.

v. **Knock knees:** This is a condition where the knees angle inwards, causing the feet to be farther apart than the knees when standing with the feet together. It can be caused by genetics, poor posture, or a lack of muscle tone in the legs.

3. Explain any five postural deformities. **(CBSE 2012)**

Ans. Some of the commonly known postural deformities are:

(i) Spinal curvature

(ii) Flat foot

(iii) Knock knees

(iv) Bow legs

(v) Round shoulder

(For detailed description refer to pages 32 to 38 of the book)

4. Explain in detail the postural deformities related to spine.

Ans. There are several postural deformities related to the spine, including:

i. **Scoliosis:** a condition where the spine curves to the side, resulting in uneven shoulders, waist and hips. Scoliosis can be congenital or develop later in life and may range from mild to severe.

ii. **Kyphosis:** an excessive curvature of the thoracic spine, resulting in a rounded upper back, hunchback posture and limited mobility. Kyphosis can be caused by poor posture, osteoporosis, or congenital conditions.

iii. **Lordosis:** an excessive inward curvature of the lumbar spine, resulting in a swayback posture and an anterior pelvic tilt. Lordosis can be caused by muscle weakness or imbalances, pregnancy, or obesity.

5. Explain the causes and corrective measures for knock knee and scoliosis. **(CBSE 2019)**

Ans. Causes of Knock Knee:

- Lack of vitamin D and minerals like calcium and phosphorus.
- Problems associated with the development of bones and joints like rickets, osteoporosis and arthritis also contribute to knock knee.
- Other possible factors include obesity, flat foot, an injury or infection affecting the knees or leg bones and carrying a heavy load at an early age.

Corrective measures

- Daily cycling for 20 to 30 minutes and horse riding would help naturally in making a gap between the knees.
- Keep a pillow between the legs while sleeping, walking or sitting daily for 15 to 20 minutes.
- Knock knees' special shoes, night braces and walking calipers may prevent knocking.
- Perform the padmasana and gomukhasana yogic poses daily.
- Supplement of vitamins D like cod liver oil and minerals like calcium and phosphorus should be taken for strengthening the bones.

Causes of Scoliosis

- The primary causes are diseases in the joints of bones, polio, rickets, infantile paralysis, cerebral palsy and juvenile osteoporosis or other diseases.
- An unhealthy diet and low levels of specific minerals can contribute to scoliosis progression.
- Carrying heavy things especially on one side should be avoided as it adds to natural pull of gravity and compresses the spine further.
- Long distance running on uneven terrain and prolonged running can result spinal compression, may bend or rotate your curve and cause greater risk of scoliosis progression. Thus, running should be limited.

Corrective measures

- Lie down facing the ground, bend your elbow, and support your body with your toes. Squeeze your abs in and hold this position for 5 seconds. Repeat technique step 10 times.
- Scoliosis can be cured by breast stroke or butterfly technique of swimming.
- Yoga has been one of the best practices to cure any ailment and also helps in enhancing overall physical strength. It maintains a balance for the body in case of scoliosis.
- Use a firm quality mattress. Avoid the soft mattresses and use extra pillows for comfort instead.
- Sitting or standing in one place for prolonged period stresses the spine. Stretch or take a walk as often as possible. Choose a chair with good support if you sit for extended period.
- For mild scoliosis football is another great exercise that can strengthen the core muscle. All positions except goalkeeper are fine.

6. What are some ways in which postural deformities can be rectified?

Ans. The ways in which postural deformities can be rectified are as follows:

- We have two types of postural deformities like functional and structural. In functional deformities only the soft tissues are affected and can be corrected by various types of physical activities. On the other hand, structural deformities affect the bony structure of body. In this case physical activities are not quite helpful but with the help of surgery desired improvement and correction can be done.
- In functional deformities, physical activities are very effective especially for those elementary school years. Most of the deformities can be corrected at this tender age.
- Corrective exercises and physical activity should be encouraged and conducted during the physical and health education period. There are numerous physical activities or exercises which would be helpful in correcting postural deformities.

7. Discuss menstrual dysfunction and its types.

Ans. Menstrual dysfunction: The average menstrual cycle consists of 21–35 days and menstrual bleeding or periods occur during the first 2–7 days of the circle. Each cycle ends on the first day of the next menstrual bleeding. Any abnormality or irregularity in this process is termed as menstrual dysfunction. Its types can be:

- Amenorrhoea: A case of delayed menarche or a case of absence of menstrual period for 6 months or more after the last period is called amenorrhoea. Sometimes, it may be absent for years.
- Dysmenorrhoea: A menstrual period accompanied by sharp pain or cramps in the lower abdomen and pelvic area is called dysmenorrhoea or painful menstruation.

- Premenstrual syndrome: Experiencing symptoms like, pain in the back legs or abdomen, acne, irritability, mood swings, water retention, tender breasts, headaches, constipation, depression or emotional stress, etc. before the onset of menstrual periods is called premenstrual syndrome.
- Menorrhagia or heavy periods: Normally the menstrual flow is heavy at first and then gradually decreases. But increased and heavy flow at regular intervals or a loss of more than 80 mL of blood during each menstrual bleeding indicates menorrhagia or heavy periods.
- Irregular periods: Mostly, menstrual cycles form a regular pattern of every 21–35 days after 1–3 years from the first bleeding or menarche. For some females, periods might skip altogether for months or come earlier than expected.
- Prolonged periods: On an average, the menstrual bleeding or periods lasts about 2–7 days. Prolonged periods are longer than this duration and occur at unpredictable intervals.
- Delay in menarche: The average age of menarche in a female ranges from 12–14 years. If it is later than 14 years and above, it is a case of delayed menarche, which is also termed as primary amenorrhoea.

8. Describe the relationship between menstruation, women's health and sports participation.

Ans. Relationship between menstruation, women's health and sports participation can be discussed as under:

- It is commonly believed that taking part in exercises and sports activities during menstruation causes serious damage to health and effects women's sports performance. There have been a number of discussions on the subject and, therefore, we cannot overlook this reproductive process during training, planning, schedules and preparing for competitions, etc. But we cannot take it as final. It is simply a normal cycle every healthy woman experiences during her reproductive years. A woman has two menstrual cycles each of different schedules and it is during the second phase, i.e. luteal phase the oestrogen rises and causes changes in body temperature, metabolism and recovery time. During the bleeding period, there is a slight drop in a woman's weight but it has been found that women perform even better during their periods.
- The fact is effects of menstruation have different mechanism in different women and women does not always respond to it in similar cases in most cases. Performance can be poor but better at any time.
- Lastly, exercises and sports activities are essential for every individual to lead a healthy life and the overall well-being.

9. Discuss female athletes triad in detail.

(CBSE 2016)

Ans. It is a serious disorder of three interrelated medical conditions: energy deficiency with or without eating disorders; menstrual disturbances; and reduced bone mineral density which is likely to cause osteoporosis. The triad usually affects teenage girls who consume less calories and exercise excessively. They may develop eating disorders and become obsessed with exercise in their efforts to maintain their physique. Female athletes often restrict calorie intake and perform intensive training and exercise to achieve low body weight to enhance sports performance. Therefore, they are at greater risk of suffering from this syndrome.

Energy deficiency leads to menstrual disturbances like amenorrhoea which is associated with low oestrogen levels. Low oestrogen levels contribute to a decrease in bone density and lack of calcium and vitamin D in the body. This is one of the main causes of osteoporosis. A female is likely to have the other two conditions if she is suffering from one condition of the triad. In this endeavour, the help of coaches, trainers, physicians and fitness experts is crucial.

10. Make a table discussing eating disorders, their causes, symptoms and management.

Ans. Eating disorders are a range of psychological disorders in which a person's eating behaviour is abnormal. Eating disorders may include inadequate or excessive food intake which can ultimately harm an individual's well-being. It is commonly exhibited along with conditions such as anxiety, depression and other addictive or self-destructive behaviours. Patients of eating disorders are often obsessed with food, body image and weight. Eating disorders are serious emotional and physical problems that can have life-threatening consequences, it is dangerous to view them as a lifestyle choice. Any one can fall prey to it at any stage. It severely undermines

growth and development inflicting side effects like malnutrition and electrolyte imbalance. Major eating disorders include anorexia nervosa and bulimia nervosa.

Anorexia nervosa:	Bulimia nervosa:
Anorexia nervosa is an eating disorder in which the patients have an obsessive fear of gaining weight. **Causes of anorexia nervosa** • Psychological factors • Social factors • Biological factors **Symptoms:** • Physical symptoms • Emotional symptoms **Management of anorexia:** • It is paramount to accept the reality of the situation. The patients must realise their own condition and accept that they have to recover. The physical aspects of the treatment can only start after this acceptance. • **The** main goal is to regain the appropriate weight as per the individual's height and age. This can be achieved with the help of a psychologist and a fitness expert.	**Bulimia nervosa,** or simply bulimia, is an eating disorder in which the patient consumes a large quantity of food within a short period and subsequently ejects it from the body through vomiting, or with the help of laxatives or diuretics. **Causes of bulimia:** The factors that cause or contribute to bulimia are: • Genetics • Psychological factors • Performance pressure in sports • Social factors **Symptoms:** • The affected individuals visit the bathroom after every meal to immediately vomit and purge themselves. • They become dehydrated due to repeated vomiting. Another side effect is inflammation of the food pipe. • The individuals eat until they begin to experience abdominal pain and discomfort. • They undergo extreme exercise routines to control their weight. **Treatment of bulimia** Psychological treatment Healthy weight and proper nutrition Exercise correctly

F. Value-Based Question

Irfan suggested to his sister Shumaila not to slouch (lazy and drooping way) in the chair rather always sit with your back straight. He also explained the advantages and disadvantages of sitting in correct posture. Shumaila immediately followed his instructions and thanked him for telling her the benefits of sitting in a correct posture.

Answer the following questions based on the above passage:

1. What is correct sitting posture?

2. Which deformity can be developed by slouching?

3. What are the values shown by Irfan and his sister?

Ans. 1. The correct posture for sitting involves keeping the feet flat on the ground, with the knees at a 90-degree angle and the hips level with or higher than the knees. The back should be straight, with the shoulders relaxed and the chin parallel to the ground. The arms should rest comfortably on armrests or the desk, and the computer screen should be at eye level. It is important to take breaks and stand up and stretch periodically to avoid prolonged sitting.

2. Slouching can lead to the development of kyphosis, a postural deformity characterized by an excessive forward curvature of the upper back, resulting in a rounded or hunched-over appearance.

3. Sharing knowledge, care for others, etc.

CHAPTER 3

YOGA AS PREVENTIVE MEASURE FOR LIFESTYLE DISEASES

P. 70–76

A. Objective Type/Multiple-Choice Questions

I. Multiple-Choice Questions:

1. Which of the following factors does not cause obesity?

(a) Genetics

(b) Frequency of eating

(c) Psychological factors

(d) None of these

Ans. (d) None of these

2. What is/are the cause/s of obesity?

(a) Genetics (b) Overeating

(c) Physical inactivity (d) All of these

Ans. (d) All of these

3. Body Mass Index (BMI) can be calculated using the formula:

(a) BMI = weight in kg/(height in m)^2

(b) BMI = (weight in kg)/(height in m)^2

(c) BMI = (weight in kg)/(height in m)^2

(d) BMI = weight in kg/height in m

Ans. (a) BMI = weight in kg/(height in m)^2

4. Identify the asana: **(CBSE SP 2022)**

(a) Paschimottanasana

(b) Halasana

(c) Vajrasana

(d) Dhanurasana

Ans. (d) Dhanurasana

5. Which of the following asanas are beneficial for diabetes?

(a) Hastasana, Vajrasana, Vrikshasana

(b) Bhujangasana, Paschimottanasana, Ardha Matsyendrasana

(c) Vajrasana, Trikonasana, Matsyasana

(d) Parvatasana, Shavasana, Chakrasana

Ans. (b) Bhujangasana, Paschimottanasana, Ardha Matsyendrasana

6. What is type 3 diabetes also known as?

(a) Insulin dependent diabetes

(b) Gestational diabetes

(c) Insulin independent diabetes

(d) Both (b) and (c)

Ans. (b) Gestational diabetes

7. What should be the normal blood pressure range at rest?

(a) 80–120 mm/Hg systolic and 60-90 mm/Hg diastolic

(b) 100–120 mm/Hg systolic and 60-100 mm/Hg diastolic

(c) 100–140 mm/Hg systolic and 60-90 mm/Hg diastolic

(d) 80–140 mm/Hg systolic and 50-90 mm/Hg diastolic

Ans. (c) 100–140 mm/Hg systolic and 60-90 mm/Hg diastolic

8. Vajrasana should not be performed if an individual is suffering from **(CBSE 2020)**

(a) hernia. (b) peptic ulcer.

(c) asthma. (d) chronic knee pain.

Ans. (a) hernia.

9. The benefits of Shavasana is/are: **(CBSE 2020)**

(a) It increases concentration power.

(b) It provides relaxation in high blood pressure.

(c) It is helpful in reducing stress.

(d) All of these.

Ans. (d) All of these.

10. ..... makes the spine flexible and increases its elasticity.

(a) Ardha chandrasana

(b) Paschimottanasana

(c) Ardha matsyendrasana

(d) Shavasana

Ans. (c) Ardha matsyendrasana

11. Which one of the following is not a cause of hypertension?

(a) Genetic causes

(b) Obesity

(c) Lack of exercise

(d) Incorrect body posture

Ans. (d) Incorrect body posture

12. Which one of the following asanas is not helpful in obesity?

(a) Tadasana

(b) Pavanmuktasana

(c) Ardha Matsyendrasana

(d) Mandukasana

Ans. (d) Mandukasana

13. Which of the following asanas is the best for asthma?

(a) Makarasana (b) Chakrasana

(c) Bhujangasana (d) Pavanmuktasana

Ans. (c) Bhujangasana

14. Gomukhasana, Vakrasana and Matsyasana are helpful in the treatment of which disease?

(a) Diabetes (b) Obesity

(c) Asthma (d) Hypertension

Ans. (c) Asthma

15. Which asana means crocodile pose in English?

(a) Vakrasana (b) Makarasana

(c) Bhujangasana (d) Ushtrasana

Ans. (b) Makarasana

16. Gomukhasana, Dhanurasana and Matsyasana are helpful in curing which disease?

(a) Diabetes (b) Hypertension

(c) Asthma (d) Obesity

Ans. (c) Asthma

II. Match the following:

List I – Problem		List II – Causes	
(i)	Diabetes	(1)	Allergic
(ii)	hypertension	(2)	Sugar build-up
(iii)	Asthma	(3)	Overeating
(iv)	Obesity	(4)	Incorrect posture

Select the correct set of options:

(a) (i)–(3), (ii)–(4), (iii)–(2), (iv)–(1)

(b) (i)–(2), (ii)–(4), (iii)–(1), (iv)–(3)

(c) (i)–(1), (ii)–(2), (iii)–(3), (iv)–(4)

(d) (i)–(4), (ii)–(3), (iii)–(2), (iv)–(1)

Ans. (b) (i)–(2), (ii)–(4), (iii)–(1), (iv)–(3)

III. Assertion-Reason Type Questions: CBQ

Given below are the two statements labelled Assertion (A) and Reason (R).

A: Obesity is a physical condition in which a person accumulates fat in excess so much so that it has a negative effect on his/her health.

R: Obesity has become a universal problem.

In the context of the two statements given above, which one of the following is correct?

(a) Both (A) and (R) are true and (R) is the correct explanation of (A).

(b) Both (A) and (R) are true but (R) is not the correct explanation of (A).

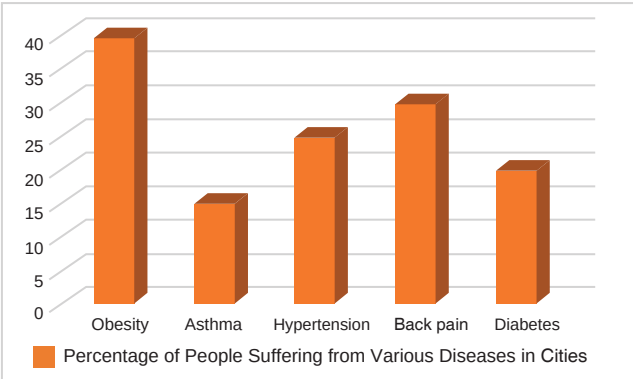
(c) (A) is true, but (R) is false.

(d) (A) is false, but (R) is true.

Ans. (b) Both (A) and (R) are true but (R) is not the correct explanation of (A).

IV. Data-Based Questions: CBQ

Given below is the graph which depicts the percentage of people suffering from various diseases in cities:



On the basis of the graph given above, answer the following questions:

1. Which of the following reasons can cause asthma?

(a) Genetics (b) Allergens

(c) Respiratory infections (d) All of these

2. Slouching due to electric gadgets causes which type of back/neck pain?

(a) Cervical (b) Lumbar

(c) Both (a) and (b) (d) None of these

3. Which of the given diseases can be classified as insulin dependent and insulin independent?

(a) Diabetes (b) Asthma

(c) Hypertension (d) Obesity

Ans. **1.** (d) All of these; **2.** (c) Both (a) and (b); **3.** (a) Diabetes

V. Picture-Based Questions: CBQ

1. Identify the following asanas and write their names:

(a)  .....

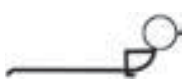
(b)  .....

(c)  .....

(d)  .....

Ans. (a) Gomukhasana; (b) Matsyasana;
(c) Shalabhasana; (d) Paschimottanasana

2. Identify the following stick figures of asanas and write their names.

(a) 

(b) 

(c) 

(d) 

Ans. (a) Bhujangasana
(b) Trikonasana
(c) Paschimottanasana
(d) Ardha Matsyendrasana

VI. Case-Based Questions: CBQ

1. A 30-year-old hotel manager, weighing 105 kg is suffering from hypertension and is extremely prone to strokes and chronic kidney diseases.

On the basis of the case given, answer the following questions:

(a) What could possibly be a cause of his hypertension?

(b) Which asanas should he preferably practice?

(c) Hypertension is increase in ..... level beyond normal.

(d) Four main causes of hypertension are ....., ..., ... and .....

Ans. (a) Obesity
(b) Ardha Halasana
(c) Blood pressure
(d) Genetic, unhealthy lifestyle, Obesity, lack of exercise

2.


Figure A


Figure B

Look at the given figures and answer the following questions.

(a) Which disease(s) does the asana shown in Figure A treat?

(b) Which disease(s) does the asana shown in Figure B treat?

(c) The asana shown in Figure A is _____

(d) The asana shown in Figure B is _____

Ans. (a) Figure A is beneficial of diabetes
(b) Figure B is beneficial for obesity.
(c) Bhujangasana
(d) Ushtrasana

B. Very Short Answer Type Questions

1. What is obesity?

Ans. Obesity is a physical condition in which a person has accumulated so much body fat that it might have a negative effect on her/his health.

2. What is meant by Tadasana?

Ans. The prefix 'tada' means 'palm', so this asana is also referred to as palm tree pose. Alternatively, it is also called the mountain pose.

3. Define Katichakrasana. Why is it called the lumbar twist pose?

Ans. 'Kati' in Sanskrit means 'waist' and 'Chakra' means 'wheel'. Katichakrasana is a yoga posture that involves a seated spinal twist. It is called the lumbar twist pose because it primarily targets and stretches the muscles of the lumbar spine.

4. What do you mean by Pavanmuktasana?

Ans. Pavanmuktasana means wind removing pose.

5. Define Matsyasana.

Ans. Matsyasana is a yoga posture that involves lying on the back and arching the chest upward. It is also known as the Fish Pose and helps to stretch the chest, neck, and spine.

6. What is Paschimottanasana?

Ans. Paschimottanasana is a yoga posture that involves seated forward bending. It helps to stretch the hamstrings, spine, and shoulders. It is also known as the Seated Forward Bend Pose.

7. What do you mean by Ardha Matsyendrasana?

Ans. Ardha meaning half, matsya meaning fish, indra meaning king. It also known as Half Lord of the Fishes pose and Half Spinal Twist Pose is a seated yoga pose. It is named after Yogi Matsyendranath.

8. What is Dhanurasana?

Ans. 'Dhanur' in Sanskrit means 'bow' and 'asana' means 'pose'. In this pose, the posture of the body resembles a bow with string attached to it.

9. Define Surya Bhedhana Pranayama.

Ans. 'Surya' in Sanskrit and Hindi means the 'sun' and 'Bhedhana' means 'piercing, enter or breaking through something'. According to Yoga, the Surya nadi or pingala is the right nostril and Chandra nadi or ida is the left nostril. In this pranayama, right nostril is used for inhalation and the left nostril for exhalation. The same process is repeated in each round.

10. Which asana is also known as the cobra pose?

Ans. Bhujangasana

11. What do you mean by Supt Vajrasana?

Ans. Supta Vajrasana is the further extension of Vajrasana. It is Vajrasana in lying position.

12. Define Gomukhasana.

Ans. Gomukhasana, go means cow and mukha means mouth or face, is also known as cow face pose. It is so named because the overall position of the thighs, calves and feet of the person has the appearance of the face of a cow when viewed from above.

13. What is Kapalabhati?

Ans. In Sanskrit, 'Kapal' means 'skull' and 'Bhati' means 'to shine'. So, this can be translated as skull-shining or skull-cleaning breathing exercise. It purifies the head and the lungs.

14. What is hypertension?

Ans. An increase in blood pressure beyond normal level is called hypertension.

15. Define Ardha Halasana.

Ans. In Sanskrit 'Ardha' means 'half' and 'Hala' means 'plough'. It is a preparatory practise of Halasana. So, this is half plough pose.

16. Define Makarasana.

Ans. In Sanskrit, 'Makara' means 'crocodile'. The other name of this asana is crocodile pose or relaxation pose. In this pose, the body resembles the shape of a crocodile.

C. Short Answer Type-I Questions

1. Write any two benefits of Katichakrasana.

Ans. **i.** It stretches the waist region and thus, tones up the lower back region.

ii. It strengthens shoulders, neck, arms, abdomen, back and thighs.

2. Explain any two benefits of Ardha Matsyendrasana. **(CBSE SP 2021 Term 2)**

Ans. **i.** It brings relief from stiffness, stress and tension in the back.

ii. By opening up the chest, it greatly increases the supply of oxygen to the lungs.

3. Karthik's body weight is 20% more than his ideal body weight. He is a student of class 10. According to you, what can be the reasons for the extra weight of his body?

Ans. In my view reasons for extra weight can include a lack of physical activity, unhealthy diet, genetics, hormonal imbalances, medication side effects, stress and certain medical conditions. It is essential for Karthik to consult with a healthcare professional to determine the underlying cause of his excess weight and receive appropriate advice for a healthy lifestyle.

4. How Shavasana is beneficial for reducing hypertension?

Ans. Shavasana, also known as the Corpse Pose, can be beneficial for reducing hypertension by inducing a state of deep relaxation, which can lower blood pressure. It also helps to reduce stress, which is a significant contributor to high blood pressure.

5. What is the procedure of Dhanurasana?

Ans. **Procedure:**

i. Lie in prone position with your arms placed beside your body and feet hip-width apart and chin resting on the ground.

ii. Now, gently fold your knees and try to place your ankles on your hips.

iii. Hold your ankles firmly with your hands.

iv. Inhaling, try to raise your thighs and chest off the ground as high as possible.

v. Now try to maintain this position for about 5–10 seconds.

vi. To come back, leave your ankles and lie down straight again.

6. Write any two contraindications of Surya Bhedhana Pranayama.

Ans. **Contraindications:**

i. Do not perform this pranayama if undergone brain surgery or heart surgery.

ii. People with high blood pressure should avoid this.

7. Write any two benefits of yogamudra.

Ans. **Benefits:**

i. It calms the mind and nerves, and increases blood supply to the head.

ii. It increases the ability to concentrate and improves digestive function.

D. Short Answer Type-II Questions

1. "Asanas can be used as a preventive measure". Comment **(CBSE 2020)**

Ans. Recent studies have shown that asanas improve flexibility, strength, and balance; reduce stress and the conditions associated with it. It enables us to become fully aware of our body. At the same time, it helps in reducing stress and anxiety, weight, hypertension, sleep disturbances, symptoms of lower back pain and fatigue. The flexibility of the spine increases, joints become more mobile, the lymphatic system and metabolism are stimulated, circulation of blood is boosted, blood pressure is normalized and stabilised, the nervous system is soothed and sharpened, and the skin becomes clear and fresh.

2. Make a mind map showing the role of yoga in preventing lifestyle diseases.

OR

What is the role of asanas in preventing common lifestyle diseases? **(CBSE 2019, 2020)**

Ans. Asanas play an important role in preventing the onset of many adverse health conditions. It is a simple and economical preventive measure that can help in treating most of the widespread non-communicable lifestyle diseases and improving the health of people. As a preventive measure, asanas are useful in many ways:

- Mental health can be improved by performing the suitable asanas.
- Bone diseases can be prevented by performing suitable asanas.
- The various types of asanas involve twisting the body, backward and forward bends and other activities that promote digestion and help in weight loss.

3. What are some causes of obesity?

Ans. Obesity is caused by the following factors:

- Genetics: A person whose parents are obese can develop obesity.
- Overeating: Overeating is when the intake of calories is much more than what the body actually needs. This results in regular deposition of unused calories causing obesity.
- Frequency of eating: Eating frequently leads to deposition of unused calories.
- Physical inactivity: Sedentary people burn fewer calories than those who are physically active, resulting in weight gain.
- Psychological factors: For some people, emotions influence eating habits which is termed as binge eating. It occurs out of sadness, boredom, stress or anger.

4. Which asanas are helpful in reducing obesity? Explain the procedure and contraindications of any one asana. **(CBSE 2019)**

Ans. Several yoga asanas can be helpful in reducing obesity, including: Tadasana, Katichakrasana, Pavanmuktasana, Matsyasana, Halasana, Paschimottansana, Ardha Matsyendrasana, Dhanurasana, Ushtrasana, Surya Bhedhana Pranayama.

One asana that can be particularly effective in reducing obesity is the Ardha Matsyendrasana (Half Lord of the Fishes Pose). Here's how to perform this asana:

Procedure:

- Sit on the floor with your legs straight in front of you.
- Bend your right knee and place your right foot on the floor outside your left knee.
- Twist your torso to the right, placing your left elbow on the outside of your right knee.
- Hold the pose for 30-60 seconds, breathing deeply.
- Repeat on the other side.
- Contraindications for this asana include:
- People with severe back or spinal injuries should avoid this pose.

- Pregnant women should not perform this pose.
- People with digestive issues such as ulcers, hernias, or colitis should avoid this pose.

5. How do the following affect obese or overweight people?

(a) Tadasana

(b) Halasana

(c) Dhanurasana

(d) Ardha Matsyendrasana

Ans. (a) Tadasana, or the Mountain Pose, can be beneficial for obese or overweight people by improving posture, stretching the spine and legs, and increasing overall body awareness and mindfulness. It can also help to improve balance and coordination, which can be beneficial for overweight individuals who may be at higher risk of falls or injuries.

(b) Halasana, or the Plow Pose, can be helpful for obese or overweight people by stretching the spine and shoulders, toning the abdominal muscles, and stimulating the thyroid gland, which can help to regulate metabolism. However, this asana should be avoided by people with neck or back injuries, high blood pressure, or heart problems.

(c) Dhanurasana, or the Bow Pose, can be beneficial for obese or overweight people by strengthening the back and abdominal muscles, improving digestion, and stretching the entire body. However, this asana should be avoided by people with lower back injuries, hernias, or high blood pressure.

(d) Ardha Matsyendrasana, or the Half Lord of the Fishes Pose, can be helpful for obese or overweight people by stretching the spine and shoulders, improving digestion, and stimulating the abdominal organs. However, this asana should be avoided by people with severe back or spinal injuries, pregnant women, or people with digestive issues such as ulcers, hernias, or colitis.

6. How do the following affect people with diabetes?

(a) Bhujangasana

(b) Paschimottanasana

(c) Pavanmuktasana

(d) Gomukhasana

Ans. (a) Bhujangasana, or the Cobra Pose, can be beneficial for people with diabetes by stretching the spine and abdomen, stimulating the digestive organs, and improving blood circulation. It can also help to reduce stress and improve overall body awareness. However, people with lower back injuries or hernias should avoid this asana.

(b) Paschimottanasana, or the Seated Forward Bend, can be helpful for people with diabetes by stimulating the pancreas and kidneys, improving digestion, and reducing stress. However, people with lower back injuries, hernias, or high blood pressure should avoid this asana.

(c) Pavanmuktasana, or the Wind-Relieving Pose, can be beneficial for people with diabetes by massaging the digestive organs, reducing gas and bloating, and improving blood circulation. However, people with knee or hip injuries should avoid this asana.

(d) Gomukhasana, or the Cow Face Pose, can be helpful for people with diabetes by stretching the hips, shoulders, and chest, improving posture, and reducing stress. However, people with shoulder or knee injuries should avoid this asana.

7. Explain about the procedure and advantages of Bhujangasana. **(CBSE 2019)**

Ans. Procedure:

- First, you must lie flat on your stomach. Place your hands on the side and make sure the toes of each foot touches each other.
- Move your hands to the front, keeping them at the shoulder level, and place your palms on the floor.
- Balancing your body's weight on the palms, breathe in and slowly raise your head and trunk. Your arms should be bent at your elbows at this stage.
- Work towards arching your neck backward. This is done to assume the pose of a cobra with a raised hood. It is important that your shoulder blades remain firm and that your shoulders are away from your ears.
- Press your hips, thighs and feet to the floor.
- Hold the position for 15–30 seconds while breathing normally.
- To undo the pose, slowly bring your hands back to the sides. Rest your head on the ground by bringing your forehead in contact with the floor. Place your hands under your head. Then slowly rest your head on one side and breathe.

Advantages:

It puts the abdominal muscles and shoulders to work, increasing the circulation of the blood and oxygen in those regions in which they turn. It raises the body temperature and boosts the body's metabolism to the levels that are beneficial at controlling diabetes. It fights acidity, indigestion and constipation, and helps the practitioner lose weight. It enhances the function of the liver, kidney, pancreas and gall bladder. It strengthens the arms and shoulders.

8. How do the following affect people with asthma?

(a) Urdhwahastottanasana

(b) Uttanmandukasana

(c) Gomukhasana

(d) Vakrasana

(e) Bhujangasana

(f) Tadasana

(g) Matsyasana

Ans. (a) Urdhwahastottanasana, or the Raised Arms Pose, can be beneficial for people with asthma by improving breathing capacity, stretching the chest and shoulders, and reducing stress. However, people with shoulder or neck injuries should avoid this asana.

(b) Uttanmandukasana, or the Extended Frog Pose, can be helpful for people with asthma by opening up the chest and lungs, reducing stress and anxiety, and improving digestion. However, people with knee or hip injuries should avoid this asana.

(c) Gomukhasana, or the Cow Face Pose, can be beneficial for people with asthma by opening up the chest and lungs, improving posture, and reducing stress. However, people with shoulder or knee injuries should avoid this asana.

(d) Vakrasana, or the Spinal Twist Pose, can be helpful for people with asthma by improving lung function, reducing stress and anxiety, and improving digestion. However, people with back injuries should avoid this asana.

(e) Bhujangasana, or the Cobra Pose, can be beneficial for people with asthma by opening up the chest and lungs, improving breathing capacity, and reducing stress. However, people with lower back injuries should avoid this asana.

(f) Tadasana, or the Mountain Pose, can be helpful for people with asthma by improving posture, reducing stress, and improving overall body awareness. However, people with balance issues or injuries should practice this asana with caution.

(g) Matsyasana, or the Fish Pose, can be beneficial for people with asthma by improving lung capacity, reducing stress and anxiety, and stretching the chest and neck. However, people with neck or back injuries should avoid this asana.

9. How do the following affect people with hypertension?

(a) Tadasana (b) Katichakrasana

(c) Uttanpadasana (d) Ardha Halasana

(e) Bhujangasana (f) Shavasana

Ans. (a) Tadasana, or the Mountain Pose, can be beneficial for people with hypertension by improving posture, reducing stress, and improving overall body awareness. However, people with balance issues or injuries should practice this asana with caution.

(b) Katichakrasana, or the Waist Rotation Pose, can be helpful for people with hypertension by stretching the spine, reducing stress and anxiety, and improving digestion. However, people with back or neck injuries should avoid this asana.

(c) Uttanpadasana, or the Raised Leg Pose, can be beneficial for people with hypertension by improving circulation, reducing stress, and strengthening the abdominal muscles. However, people with low back pain or hernias should avoid this asana.

(d) Ardha Halasana, or the Half Plow Pose, can be helpful for people with hypertension by improving digestion, reducing stress, and stretching the lower back and legs. However, people with back or neck injuries, hernias, or high blood pressure should avoid this asana.

(e) Bhujangasana, or the Cobra Pose, can be beneficial for people with hypertension by stretching the chest and abdomen, improving circulation, and reducing stress. However, people with lower back injuries or hernias should avoid this asana.

(f) Shavasana, or the Corpse Pose, can be helpful for people with hypertension by reducing stress, improving sleep, and promoting relaxation. However, people with mobility issues or back pain may need to modify this pose to be more comfortable.

10. Write any three benefits of Ardha Halasana.

Ans. Benefits of Ardha Halasana:

i. This asana strengthens the thigh muscles and calf muscles.

ii. It stretches leg muscles and ligaments of leg.

iii. It improves digestion and removes constipation.

11. What is Yogamudra? Write any two benefits of it.

Ans. Yogamudra is a seated yoga pose that involves bending forward and reaching the arms around the back to clasp the hands. The name of the pose comes from the Sanskrit words "yoga," meaning union or connection, and "mudra," meaning gesture or seal.

Two benefits of Yogamudra are:

i. It helps to stretch and strengthen the spine, hips, and shoulders, as well as improve flexibility and range of motion.

ii. It can help to calm the mind, reduce stress and anxiety, and improve focus and concentration.

12. Make a table showing the benefits and contraindications of any three asanas to prevent diabetes.

Ans. The following table shows the benefits and contraindications of three asanas that can help prevent or manage diabetes:

Asana	Benefits	Contraindication
Bhujangasana (Cobra Pose)	Stimulates the pancreas, improves circulation and digestion, strengthens the abdominal muscles, and reduces stress and fatigue	Avoid this pose if you have a back injury, hernia, or carpal tunnel syndrome.
Paschimottanasana (Seated Forward Bend)	Regulates the insulin levels, improves circulation, and reduces stress and anxiety.	Avoid this pose if you have a back injury, herniated disc, or hip or knee pain.
Katichakrasana (Lumbar Twist Pose)	Stimulates the pancreas and abdominal organs, improves digestion, and stretches the spine and hips.	Avoid this pose if you have a back injury, herniated disc, or sciatica.

13. Write the procedure of Anuloma-Viloma.

Ans. Procedure of Anulom-vilom:

1. Sit in Padmasana or any comfortable meditative posture.

2. Keep the head and spine erect, and close your eyes.

3. Peacefully pay attention to the breath.

4. Keep the hands on the respective knees.

5. Adopt *nasagran mudra* of the right hand and *jnana mudra* of the left hand.

6. Close the right nostril with the thumb.

7. Keeping the respiration rate slow, deep and silent, inhale through the left nostril and exhale through the right nostril.

8. Inhale through the right nostril again.

9. Keeping the respiration rate slow, deep and silent, exhale through the left nostril.

14. Explain the procedure of any two asanas for the prevention and management of hypertension.

Ans. Here are the procedures for practicing Makarasana and Shavasana for the prevention and management of hypertension:

Procedure of Makarasana:

i. Lie down on your stomach.

ii. Keep the legs at a comfortable distance, with heels inside and toes pointing outward.

iii. Now, fold your arms and elbows, and keep them under the head.

iv. Place your head on the cushion of the arms. Close your eyes and relax.

v. To release the pose, bring the arms alongside the body and both the legs together.

Procedure of Shavasana:

i. Lie flat on the floor and make sure you are comfortable. Close your eyes.

ii. Place your legs in such a way that your toes are facing sideways. The legs should be placed comfortably apart.

iii. Place your arms along your body with open palms facing upwards. While doing so, leave space between your body and arms.

iv. After reaching a position, direct your attention to every area of your body, starting from your toes.

v. Take slow but deep breaths, allowing your body to go into a state of intense relaxation. Avoid falling asleep.

vi. Once your body feels relaxed and refreshed, roll to one side, keeping your eyes closed. Hold the position for a minute and rise to sit in Sukhasana.

vii. Breathe deeply, become aware of your surroundings before you open your eyes again.

15. Write any three benefits of Sheetali Pranayama.

Ans. Benefits of Sheetli Pranayama:

i. This pranayama purifies the blood.

ii. It has a cooling effect on the body.

iii. It is beneficial for people suffering from high blood pressure.

16. List down any three asanas used for preventing asthma and write any two benefits of it.

(CBSE SP 2021 Term 2)

Ans. Three asanas are given below: These can be helpful in preventing asthma, along with their benefits:

Dhanurasana (Bow Pose): Dhanurasana helps to expand the chest and improve lung capacity, which can be beneficial for individuals with asthma. It also strengthens the back and improves posture.

Ushtrasana (Camel Pose): Ushtrasana opens up the chest and increases lung capacity, which can be helpful for individuals with asthma. It also strengthens the back, neck, and legs, and improves digestion.

Vakrasana (Twisted Pose): Vakrasana helps to stretch and strengthen the muscles around the lungs, which can improve breathing and prevent asthma attacks. It also helps to improve digestion and reduce stress and anxiety.

E. Long Answer Type Questions

1. Discuss the impact of asanas on health.

Ans. We see the health of human beings is deteriorating day by day and lifestyle diseases are spiking due to factors such as sedentary lifestyle, bad diet and increasing presence of bacteria, parasites and viruses in the environment. Globally, the challenge is to develop new and stronger antibiotics and drugs to control and kill these new viruses and bacteria. In such circumstances, asanas play an important role in preventing the onset of many adverse health conditions.

Asana is a simple and economical preventive measure that can help in treating most of the widespread non-communicable lifestyle diseases and improve the health of people. The aim of an asana is to clean the body from within, fix the internal imbalance and then strengthen the exteriors. It enables us to become fully aware of our body. It helps in reducing stress and anxiety, weight, hypertension, sleep disturbances, symptoms of lower back pain and fatigue. The flexibility of the spine increases, joints become more mobile, the lymphatic system and metabolism are stimulated, circulation of blood is boosted, blood pressure is normalised and stabilised, the nervous system is soothed and sharpened, and the skin becomes clear and fresh.

2. Briefly explain the symptoms and causes of asthma. Make a table explaining the procedure, benefits and contraindications of any two asanas to prevent asthma. **(CBSE 2018)**

Ans. Asthma is a disease associated with respiratory tracks (air ways in the lungs)

Symptoms: Excessive amount of mucus, coughing, heavy breathing, wheezing or whistling, shortness of breath, swelling of air ways, chest tightness, fatigue,

Causes of Asthma:

- Allergy
- Heredity
- Occupational Asthma (caused by inhaling fumes, gases, dust or other potentially harmful substances in work place)
- Cigarette smoking/passive smoking and polluted air
- Exposure to animals that cause allergy (pets)

Here is a table explaining the procedure, benefits, and contraindications of two asanas that can be helpful in preventing asthma:

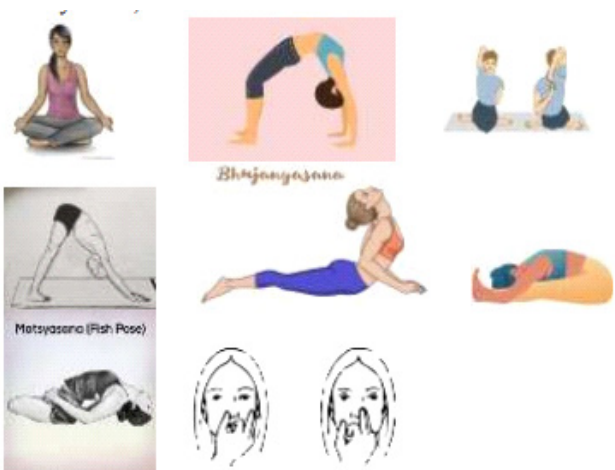
Asana		Procedure		Benefits		Contraindications
Urdhwahastottanasana	**1.**	Stand with feet hip-width apart and arms at sides.	**1.**	Stretches the chest and lungs, improving breathing.	**1.**	High blood pressure.
	2.	Inhale and reach arms overhead, palms facing each other.	**2.**	Improves posture and digestion.	**2.**	Neck or back injury.
	3.	Lengthen through the spine and hold for several breaths.	**3.**	Reduces stress and anxiety.	**3.**	
	4.	Exhale and release arms back to sides				

Asana		Procedure		Benefits		Contraindications
Uttanmandukasana	**1.**	Kneel on the floor with toes touching and sit back on heels.	**1.**	Improves lung capacity and reduces stress and anxiety.	**1.**	Knee or ankle injury.
	2.	Place hands on lower back and inhale deeply.	**2.**	Stretches the chest and lungs, improving breathing.	**2.**	High blood pressure.
	3.	Exhale and reach arms overhead, palms facing each other.	**3.**	Strengthens the back and shoulders.	**3.**	Herniated disk.
	4.	Hold for several breaths and release.				

3. List down any four asanas used for prevention of asthma. Explain the procedure for administration of any one of them with help of a stick diagram.

(CBSE SP 2022)

Ans. **Asthma:** Sukhasana, Chakrasana, Gomukhasana, Parvatasana, Bhujangasana, Paschimottanasana, Matsyasana, Anulom-Vilom



4. Briefly explain the administration of Pavanmuktasana along with its contraindication and draw stick diagram.

(CBSE SP 2021 Term 2)

Ans. PAVANMUKTASANA:

Procedure

i. Ideally, this asana should be performed in the morning in order to get rid of gas inside your body. It is particularly effective to do it as the first step of your morning routine since it will make other poses easier. If not, then allow at least four to six hours to pass after your meal.

ii. Lie on your back on a smooth and flat surface and keep the legs straight and relax.

iii. Inhaling slowly, raise your legs and bend the knees. Bring them gradually towards the chest till your thighs touch the stomach.

iv. Clasp your hands around your legs to hug your knees. Lock your fingers to secure the position.

v. Next, try to touch the knee with the nose tip.

vi. Hold this position for 20 to 30 seconds.

vii. Exhale slowly and undo the pose after you roll from side to side about three to five times. Relax.

viii. Practise 3 to 5 cycles daily.

Contraindications

i. Those who have had abdominal surgery recently or are suffering from hernia or piles must avoid this asana.

ii. Pregnant women must avoid this asana in order to avoid causing stress to the body or causing complications.

iii. It should also be avoided by patients of heart problems, hyper-acidity, high blood pressure, slipped disc, asthma, hernia, back and neck problems, or a testicle disorder.

iv. An individual with a neck injury should practise this asana with her/his head resting on the floor, and only with the approval of a doctor.

5. Discuss the procedure, benefits and contraindications of:

(a) Tadasana

(b) Halasana

(c) Dhanurasana

(d) Ardha Matsyendrasana

(e) Bhujangasana

(f) Paschimottanasana

(g) Pavanmuktasana

(h) Sarala Matyasana

(i) Ushtrasana

(j) Gomukhasana

(k) Anuloma-Viloma

(l) Kapalbhati

(m) Shavasana

(n) Vakrasana

(o) Shalabhasana.

Ans. (a) Tadasana: Stand straight with your feet together, inhale and raise your arms above your head, interlock your fingers and turn your palms upward. Benefits include improved posture, reduced back pain and increased lung capacity. Contraindications include low blood pressure and headache.

(b) Halasana: Lie down on your back, raise your legs up and over your head, placing your hands on your lower back for support. Benefits include improved digestion, reduced stress and improved thyroid function. Contraindications include neck injury, hernia and high blood pressure.

(c) Dhanurasana: Lie down on your stomach, bend your knees and grasp your ankles, inhale and lift your chest and legs up. Benefits include improved digestion, reduced stress and improved flexibility. Contraindications include hernia and high blood pressure.

(d) Ardha Matsyendrasana: Sit with your legs outstretched, bend your right leg and place your right foot on the outside of your left knee, twist your torso to the right and hold your left knee with your right hand. Benefits include improved digestion, reduced stress and improved spinal flexibility. Contraindications include spinal injury and hernia.

(e) Bhujangasana: Lie on your stomach, place your hands on the floor near your shoulders, inhale and lift your chest and head up. Benefits include improved posture, reduced back pain and increased lung capacity. Contraindications include hernia and high blood pressure.

(f) Paschimottanasana: Sit with your legs outstretched, inhale and raise your arms above your head, exhale and bend forward, reaching for your toes. Benefits include improved digestion, reduced stress and improved spinal flexibility. Contraindications include hernia and low blood pressure.

(g) Pavanmuktasana: Lie down on your back, bend your knees towards your chest and interlock your fingers around your shins. Benefits include improved digestion, reduced stress and improved spinal flexibility. Contraindications include hernia and high blood pressure.

(h) Sarala Matyasana: Sit with your legs outstretched, bend your right knee and place your right foot on the outside of your left knee, twist your torso to the right and place your left hand on your right knee. Benefits include improved digestion, reduced stress and improved spinal flexibility. Contraindications include spinal injury and hernia.

(i) Ushtrasana: Kneel on the floor, bend backwards and hold your heels with your hands. Benefits include improved posture, reduced back pain and improved lung capacity. Contraindications include neck injury and high blood pressure.

(j) Gomukhasana: Sit cross-legged, bring your left arm up and over your left shoulder, bring your right arm behind your back and clasp your hands. Benefits include improved

posture, reduced back pain and improved shoulder flexibility. Contraindications include shoulder injury and neck injury.

(k) Anuloma-Viloma: Sit cross-legged, close your right nostril with your thumb and inhale through your left nostril. Close your left nostril with your ring finger and exhale through your right nostril. Benefits include improved breathing and reduced stress. Contraindications include nasal congestion and sinusitis.

(l) Kapalbhati: Sit cross-legged, inhale and exhale rapidly through your nostrils, contracting your abdominal muscles with each exhale. Benefits include improved digestion, reduced stress and increased lung capacity. Contraindications include hernia and high blood pressure.

(m) Shavasana: Lie down on your back with your arms and legs relaxed, close your eyes and breathe deeply. Benefits include reduced stress and improved relaxation. Contraindications include low blood pressure and asthma.

(n) Vakrasana, also known as the Half Spinal Twist Pose, involves twisting the spine, stretching the back muscles, and improving digestion. To perform, sit with legs stretched and twist the upper body to one side while keeping the spine erect. Contraindications include spinal injuries, hernia, and ulcerative colitis.

(o) Shalabhasana, or the Locust Pose, strengthens the back muscles and helps improve posture. Lie on the stomach with hands under the thighs, then lift the legs and chest off the ground. Benefits include relief from lower back pain and improved flexibility. Contraindications include herniated discs, peptic ulcers, and recent abdominal surgeries.

6. Explain the procedure, benefits and contraindications of Supta Vajrasana.

Ans. Procedure of Supta Vajrasana:

i. Sit comfortably in Vajrasana. Slowly bend your back with the support of one elbow first and then with the other elbow.

ii. Allow your elbows to support the body.

iii. Now, stretch your arms behind and hold one elbow/arm with the hand of another arm.

iv. To come back to the original position, first take out your hands and place them by the sides of your body.

v. Now, with the help of elbows come to the initial position.

Benefits

- This asana improves the digestive system and removes constipation.
- It strengthens the abdominal muscles.
- It is useful in the management of high blood pressure and sciatica.
- It improves blood circulation and induces calmness.
- It is beneficial for asthma and respiratory disorders.
- It tones the spinal nerves, makes the back flexible and realigns rounded shoulders.
- It helps to fill the lungs to their maximum capacity and bring more oxygen.
- It increases the circulation in brain.
- It regulates the functioning of the adrenal gland.

Contraindications

i. Do not practise this asana if suffering from high blood pressure.

ii. Avoid this asana in the case of slipped disc or other knee or back problems and if suffering from vertigo.

7. Explain the procedure, benefits and contra-indications of Mandukasana.

Ans. Procedure of mandukasana:

i. Sit comfortably in Vajrasana.

ii. Make the fists with thumbs inside.

iii. Place the two fists near the navel and press the navel area.

iv. Exhale and slowly bend forward from the waist and lower the chest.

v. Keep the head and neck raised and look forward in the bent position.

vi. Keep the breath outside in this position and maintain it for 5–10 seconds.

vii. To release this posture, inhale and slowly raise the trunk up to kneeling position.

viii. Remove your fists from the navel area and sit in Vajrasana.

ix. Repeat this asana 3–5 times.

Benefits

- This asana is beneficial for all organs of the body.

- Mandukasana is beneficial for the people suffering from diabetes, constipation and digestive disorders.
- It can reduce extra fat in the belly, waist and thighs and helps in weight management.
- It helps in eliminating gas from the stomach.
- It helps tone muscles of the shoulder and abdomen.

Contraindications

i. Avoid this asana in case of back pain, slipped disc or any other spine problems.

ii. Pregnant women should avoid this asana.

iii. Avoid this in case of any recent surgery of the abdomen, chest, knees or legs.

iv. In case of ankle injury, high BP, insomnia or mirgrane, this asana should be avoided.

8. Explain the procedure, benefits and contra-indications of Uttanpadasana.

Ans. Refer to page 66 of textbook.

9. Explain the procedure, benefits and contraindications of Surya Bhedhana Pranayama.

Ans. Refer to page 57 of textbook.

10. Explain the procedure, benefits and contraindications of Ardha Halasana.

Ans. Refer to pages 66-67 of textbook.

11. Write the benefits and contraindications of Makarasana.

Ans. Refer to page 67-68 of textbook.

12. Write the benefits and contraindication of Matsyasana. **(CBSE 2022)**

Ans. Refer to page 54 of textbook.

13. What is Obesity? Draw stick diagrams of any two asanas recommended to control obesity and explain their procedure. **(CBSE 2022)**

Ans. Obesity is a medical condition characterized by excessive accumulation of body fat leading to negative health consequences. It is usually determined by calculating the body mass index (BMI) of an individual, which is the ratio of body weight to the square of height. A BMI of 30 or higher is considered obese.

Two asanas recommended for controlling obesity are:

Halasana (Plow Pose)

Halasana is an excellent asana for weight loss as it stretches and tones the muscles of the entire body, especially the abdomen and thighs. Here's how to perform Halasana:

i. Lie flat on your back with your arms at your sides and your palms facing down.

ii. Inhale deeply and lift your legs off the ground, keeping them straight.

iii. Exhale and bring your legs up and over your head until your toes touch the ground behind your head.

iv. Place your hands on your back for support and hold the pose for 30 seconds to 1 minute.

v. To come out of the pose, slowly lower your legs back down to the ground, one vertebra at a time.

Paschimottanasana (Seated Forward Bend)

Paschimottanasana is a seated forward bend that helps to stretch the hamstrings, back, and spine. It also stimulates the digestive system and helps to reduce belly fat. Here's how to perform Paschimottanasana:

i. Sit on the ground with your legs stretched out in front of you and your toes pointing up.

ii. Inhale deeply and raise your arms above your head.

iii. Exhale and bend forward from the hips, reaching for your toes with your hands.

iv. Hold the pose for 30 seconds to 1 minute, breathing deeply and relaxing your body.

v. To come out of the pose, slowly roll your body up, one vertebra at a time, and return to a seated position.

Stick Diagrams:

Halasana

Paschimottanasana

F. Value-Based Question

Neeti along with her father was regular at district park in early morning. She realised that most of the children are obese. She along with her few classmates wanted to help those children. She discussed with her physical education teacher and the principal of the school. School decided to organise awareness rally for the neighbourhood.

Answer the following questions based on the above passage:

1. How can be obesity prevented? Give two ways.
2. Give any two disadvantages of obesity.
3. What values are shown by Neeti and her classmates? **(CBSE 2015)**

Ans.

1. Obesity can be prevented by avoiding overeating, and doing asanas like vajrasana and trikonasana.
2. Hypertension, liver problem.
3. Sharing knowledge, concern for others, etc.

CHAPTER 4

PHYSICAL EDUCATION AND SPORTS FOR CWSN (CHILDREN WITH SPECIAL NEEDS- *DIVYANG*)

P. 88–93

A. Objective Type/ Multiple-Choice Questions

I. Multiple-Choice Questions:

1. The Special Olympics begun in

(a) 1948 (b) 1958

(c) 1968 (d) 1978

Ans. (c) 1968

2. Who among the following was the founder of Special Olympics games?

(a) John F Kennedy

(b) Eunice Kennedy Shriver

(c) Baron de Coubertin

(d) Sir Dorabji Tata

Ans. (b) Eunice Kennedy Shriver

3. Special Olympics logo is based on the sculpture:

(a) Joy and Happiness to All the Children of the World

(b) Punctuality and Happiness to All the Children of the World

(c) Contentment and Happiness to All the Children of the World

(d) Joy and Discipline to All the Children of the World

Ans. (a) Joy and Happiness to All the Children of the World

4. Special Olympics has more than _____ Olympic-type individual and team sports.

(a) 40 (b) 30

(c) 50 (d) 70

Ans. (b) 30

5. _____ is an early childhood play programme for children with and without intellectual disabilities, ages 2 to 7 years old.

(a) Disabled Athletes (b) Abled Athletes

(c) Old Athletes (d) Young Athletes

Ans. (d) Young Athletes

6. In the Special Olympics competitions,_____ are awarded medals.

(a) first four place winners

(b) first three place winners

(c) first five place winners

(d) first eight place winners

Ans. (b) first three place winners

7. _____are the parallel games to Olympics.

(a) Special Olympics

(b) Deaflympics

(c) Paralympics

(d) Asian Games

Ans. (c) Paralympics

8. The term 'Paralympic' was first used in the 1988 Summer Paralympics in

(a) Rome, Italy. (b) Tokyo, Japan

(c) Atlanta, USA. (d) Seoul, South Korea.

Ans. (d) Seoul, South Korea.

9. Which of these is not one of the colours of the three crescents in the Paralympic logo?

(a) Red (b) Yellow

(c) Blue (d) Green

Ans. (b) Yellow

10. There are currently _____Paralympic sports.

(a) 22 (b) 25

(c) 27 (d) 28

Ans. (d) 28

11. Sir Ludwig Guttmann started the

(a) Olympic movement.

(b) Paralympic movement.

(c) Special Olympic movement.

(d) Deaflympic movement.

Ans. (b) Paralympic movement.

12. The motto of the Paralympic Games is

(a) Spirit in Motion. (b) Spirit of Motion.

(c) Motion of Spirit. (d) Spirit and Motion.

Ans. (a) Spirit in Motion.

13. Which of the following is not ataxia impairment?

(a) Cerebral palsy (b) Friedreich's ataxia

(c) Down's syndrome (d) Multiple sclerosis

Ans. (c) Down's syndrome

14. The hand shapes that are formed in Deaflympics logo represent:

(a) 'ok', 'good' and 'great'.

(b) 'well', 'good' and 'great'.

(c) 'ok', 'brilliant' and 'great'.

(d) 'ok', 'good' and 'carry on'.

Ans. (a) 'ok', 'good' and 'great'.

15. Which of the following is not a criterion of participating in Deaflympics?

(a) The participant must have hearing loss of at least 55 decibels in her/his better ear.

(b) Hearing aids and cochlear implants are allowed.

(c) The athlete cannot be guided by sounds.

(d) A drug-free sports environment is enforced for participants.

Ans. (b) Hearing aids and cochlear implants are allowed.

16. Which of these is not one of the results of physical activities in children with special needs?

(a) Important in confidence

(b) Improvement in endurance

(c) Increase in depression

(d) Better hand-eye coordination

Ans. (c) Increase in depression

17. What is the most important, while dealing with CWSN? **(CBSE 2020)**

(a) Time (b) Patience

(c) Sympathy (d) All of these

Ans. (c) Sympathy

18. Watching others play and enjoy which in turn motivates the child with special needs to participate is a part of which kind of strategy?

(a) Mental (b) Psychological

(c) Physical (d) Social

(CBSE SP 2022)

Ans. (d) Social

II. Match the following:

	List I – Event		List II – Year
(i)	The Special Olympics began.	(1)	1988
(ii)	The term 'Paralympic' was officially used.	(2)	1924
(iii)	The International Paralympic Committee was founded.	(3)	1968
(iv)	Deaflympics were first held in.	(4)	1989

Select the correct set of options:

(a) (i)–(3), (ii)–(1), (iii)–(4), (iv)–(2)

(b) (i)–(2), (ii)–(4), (iii)–(1), (iv)–(3)

(c) (i)–(1), (ii)–(2), (iii)–(3), (iv)–(4)

(d) (i)–(4), (ii)–(3), (iii)–(2), (iv)–(1)

Ans. (a) (i)–(3), (ii)–(1), (iii)–(4), (iv)–(2)

III. Assertion-Reason Type Questions: CBQ

Given below are the two statements labelled Assertion (A) and Reason (R).

A: Physical activities sharpen the mind, allowing the child with disability to have enhanced cognitive skills.

R: Physical activities are performed in an interactive environment. By taking part in such group activities, the social life of the child improves and she/he learns to establish relationships with her/his peers.

In the context of the two statements given above, which one of the following is correct?

(a) Both (A) and (R) are true and (R) is the correct explanation of (A).

(b) Both (A) and (R) are true but (R) is not the correct explanation of (A).

(c) (A) is true, but (R) is false.

(d) (A) is false, but (R) is true.

Ans. (b) Both (A) and (R) are true but (R) is not the correct explanation of (A).

IV. Data-Based Questions: CBQ

Read the passage with statistics given below and answer the questions that follow.

Though the game started with just 148 athletes from nine countries, 336 participants from 27 nations participated in the 2015 Winter edition, while 3148 athletes from 97 countries competed in the 2017 summer edition.'

1. Which games are being referred to in the above statistics?

(a) Paralympics (b) Olympics

(c) Deaflympics (d) Special Olympics

2. These games are held every _____ years.

(a) 4 (b) 5

(c) 6 (d) 7

3. These games were first held in 1924 in _____

(a) Nuremberg, German

(b) Milan, Italy

(c) Helsinki, Finland

(d) Paris, France

4. The centre of the logo of these games represents

(a) the iris of the eye.

(b) the cornea of the eye.

(c) the pupil of the eye.

(d) the eyeball of the eye.

Ans. 1. (c) Deaflympics

2. (a) 4

3. (d) Paris, France

4. (a) the iris of the eye.

V. Picture-Based Questions: CBQ

Identify the following disorders/disabilities:

Identify the following logo/sport:

1. 

.....

2. 

.....

3. 

.....

4. 

.....

Ans. 1. Special Olympics

2. Wheelchair Basketball

3. Deafylympics

4. Paralympics

VI. Case-Based Questions: CBQ

1. 

Figure A

Figure B

Look at the given figures and answer the following questions.

(a) What do the above figures represent?

(b) How many sports do each of these organise?

(c) Who were the founders of these sports movements?

(d) Which were the first host cities of these games?

Ans. (a) Figure A represents Special Olympics and figure B represents Paralympics games.

(b) Special Olympics organizes 30 games and Paralympics organizes 28 games.

(c) Eunice Kennedy Shriver founded Special Olympics and Sir Ludwig Guttmann founded Paralympics.

(d) Chicago (USA) first hosted Special Olympics and Rome (Italy) first hosted Paralympics.

2. In relation to the pictures, answer the following questions.

Figure A

Figure B

(a) What is the mission of the Figure A organisation?

(b) What is the Motto of the Figure A organisation?

(c) Until 1965 the games in Figure B were known as _____

(d) Figure B games are conducted after every _____years.

Ans. (a) Mission of Special Olympics: To provide sports training and organise athletic competitions in various Olympic-type sports for children and adults with intellectual disabilities throughout the year.

(b) Motto of Deafylympics: *"Per Ludos Aequalitas"* which is Latin for "Equality through Sports".

(c) International Games for the Deaf

(d) 2 years

B. Very Short Answer Type Questions

1. What is Special Olympics? **(CBSE 2020)**

Ans. Special Olympics is an international organisation that provides sports training and competition for children and adults with intellectual disabilities, promoting inclusion, empowerment, and improved physical and social skills.

2. Who founded Special Olympics?

Ans. Special Olympics was founded by Eunice Kennedy Shriver in 1968.

3. What is Unified Sports Programme?

Ans. Unified sports is a program that promotes social inclusion and friendship through sports by bringing together athletes with or without intellectual disabilities on the same team.

4. Who oversees the Paralympic Games?

Ans. The International Paralympic Committee (IPC) oversees the Paralympic Games. The IPC is responsible for organising and supervising the Paralympic Games, as well as promoting and developing the Paralympic movement worldwide.

5. Who started the Paralympic Games?

Ans. The Paralympic Games were started by Sir Ludwig Guttmann, a neurologist who organised the first competition for wheelchair athletes in 1948 at Stoke Mandeville Hospital in England.

6. What are the Deaflympics about?

Ans. The Deaflympics are an international multi-sport event for deaf athletes. The games provide a platform for deaf athletes to compete at an elite level and promote deaf culture and awareness.

C. Short Answer Type-I Questions

1. In which year did Special Olympics begin?

Ans. Special Olympics began in 1968, when Eunice Kennedy Shriver organised the first international sports competition for individuals with intellectual disabilities at Soldier Field in Chicago, USA.

2. How many events of Special Olympics are conducted in a year?

Ans. Special Olympics offers year-round sports training and competition for individuals with intellectual disabilities, with over 30 Olympic-type sports and tens of thousands of events held annually across the globe.

3. What is Special Olympics logo based on?

Ans. The Special Olympics logo has three asymmetrical crescents called agito, circling around a central point. The crescents are red, blue and green in colour. The colours represent the diversity of the athletes and the unity of the Special Olympics movement.

4. Which programmes are conducted under Special Olympics across the world?

Ans. Special Olympics offers a variety of programs across the world, including year-round sports training and competition for individuals with intellectual disabilities, as well as health services, leadership training, and educational opportunities. Over 30 Olympic-type sports are offered, with tens of thousands of events held annually. Additionally, the organisation promotes social inclusion, awareness, and acceptance through various campaigns and initiatives.

5. Health screening is offered in eight disciplines. Mention any four. **(CBSE 2018)**

Ans. It was in 1997 that Special Olympics Healthy Athletes took an initiative to offer free health screenings and education to athletes in a warm and fun environment. Health screening is offered in eight disciplines. Four of them are given below:

i. MedFest (history and physical exam)

ii. Special Olympics Lions Clubs International Opening Eyes (vision/eye health)

iii. Healthy Hearing (audiology)

iv. Special Smiles (dentistry)

6. Who participate in the Paralympic games?

Ans. The Paralympic Games are open to athletes with physical, sensory, and intellectual disabilities. Athletes are classified based on their impairment to ensure fair competition. The games feature a variety of sports, including athletics, swimming, wheelchair basketball, wheelchair rugby and many more.

7. How many sports are included in Paralympic games?

Ans. There are currently 28 Paralympic sports (22 summer and 6 winter) approved by the IPC.

8. There are about 10 disability categories, including physical, visual and intellectual impairment, which have been recognised by the IPC. Mention any four.

Ans. The International Paralympic Committee recognises 10 disability categories, including physical impairment, visual impairment and intellectual impairment. Four of these categories are:

i. **Impaired muscle power:** In this category of impairment, the force generated by muscles, such as the muscles of one limb, one side of the body or the lower half of the body is reduced, (For example, spinal cord injury, spina bifida, post-polio syndrome).

ii. **Impaired passive range of movement:** The range of movement in one or more joints is reduced in a systematic way. Acute conditions such as arthritis are not included.

iii. **Loss of limb or limb deficiency:** A total or partial absence of bones or joints from partial or total loss due to illness, trauma, or congenital limb deficiency (For example, dysmelia).

iv. **Leg-length difference:** Significant bone shortening occurs in one leg due to congenital deficiency or trauma.

9. What do the colours in Deaflympic logo signify?

Ans. The logo was designed in 2003 and symbolises a positive and powerful deaf sports community. It represents sign language, deaf and international cultures, unity and continuity.

10. Mention any two criteria of participating in Deaflympics.

Ans. To participate in the Deaflympics, athletes must meet two criteria:

i. They must have a hearing loss of at least 55 decibels in their better ear.

ii. They must compete without the use of hearing aids or cochlear implants.

11. Mention any two advantages of physical activities for CWSN.

Ans. Physical activities can provide numerous benefits for children with special needs, including:

i. Improved physical health, such as increased strength, flexibility, and endurance.

ii. Enhanced social skills, self-esteem and confidence, as well as opportunities for inclusion and social interaction with peers.

12. What special provisions would you recommend in your school so that CWSN get a chance to join the mainstream?

Ans. To ensure that children with special needs have access to a quality education and can join the mainstream, some provisions that can be made in schools include:

i. Providing assistive technology and accommodations, such as sign language interpreters or assistive devices.

ii. Offering individualised education plans and specialised instruction to meet the unique needs of each child.

iii. Creating a safe and inclusive environment that promotes respect and acceptance of all students, regardless of ability.

D. Short Answer Type-II Questions

1. What was the thought behind starting Special Olympics?

Ans. Eunice Kennedy Shriver founded the Special Olympics in 1968 with the belief that individuals with intellectual disabilities could benefit from participating in sports and physical activities. She recognised the lack of opportunities and discrimination that these individuals faced and wanted to provide them with a chance to showcase their abilities and break down societal barriers. Through sports, she believed that individuals with intellectual disabilities could develop physical fitness, self-esteem, and leadership skills, as well as improve social integration and community acceptance. Today, the Special Olympics continues to promote inclusion, acceptance, and respect for individuals with intellectual disabilities around the world.

2. What does the logo of Special Olympics signify?

Ans. The Special Olympics logo depicts five figures in a unifying circle, symbolising our global presence.

The figures have arms in a lowered position, recalling the time when many people were unaware of the talents and abilities of adults and children with intellectual disabilities — a time before the founding of Special Olympics.

The straight arms describe greater equality and outreach. The raised arms represent 'joy', and continued realization of ultimate goals.

3. Write briefly about one of the programmes under Special Olympics.

Ans. Young Athletes Programme comes under Special Olympics:

Young Athletes Programme: Special Olympics Young Athletes is an early childhood play programme for children with and without intellectual disabilities, ages 2 to 7 years old. Young athletes are encouraged to play basic sport skills, like running, kicking and throwing. Children learn how to play together and develop important skills as they learn to share, take turns and follow directions. They also develop motor skills. These skills help children further in their day-to-day lives. Children are thus taught healthy habits while they are young which lead to physical activity, friendships and learning. Young Athletes, apart from children, targets their families and people in the community so that they can be a part of an inclusive team too.

4. Make a table on the programmes under Special Olympics across the world and their significance.

Ans. Here is a table outlining some of the programs under Special Olympics and their significance:

Program	Significance
Sports Training and Competition	Provides individuals with intellectual disabilities opportunities to develop physical fitness, skills, and social interaction through year-round sports training and competition at local, regional, and international levels.

Athlete Leadership Programs	Empowers athletes to develop leadership skills and take on meaningful roles in their communities through activities such as public speaking, mentoring, and advocacy.
Unified Sports	Brings together individuals with and without intellectual disabilities to compete on the same teams, promoting inclusion and breaking down stereotypes.
Healthy Athletes	Provides free health screenings and education to athletes, promoting overall health and wellness and addressing the health disparities faced by individuals with intellectual disabilities.
Young Athletes	Introduces children aged 2–7 with intellectual disabilities to the world of sports through fun activities that promote physical, cognitive and social development.

5. Write briefly about IPC.

Ans. The International Paralympic Committee (IPC) was founded on 22 September 1989. It is an international non-profit organisation in Dusseldorf, Germany, to act as the global governing body of the Paralympic Movement.

IPC organises not only the Summer and the Winter Paralympic Games but it also coordinates and administers world championships and other competitions. The vision statement of IPC is 'To enable Para athletes to achieve sporting excellence and inspire and excite the world.' The Paralympic anthem is 'Hymne de' LAvenir" or ''Anthem of the Future." It was composed by Thierry Darnis and adopted as the official anthem of the IPC in March 1966.

The Paralympic Games are an international multi-sporting event involving athletes with a variety of physical and intellectual disabilities, including mobility disabilities, amputation, blindness, short stature and cerebral palsy. The IPC oversees the organisation of these Games, which are held immediately after the Summer and Winter Olympics as Summer Paralympic Games and Winter Paralympic Games, respectively.

There are currently 28 Paralympic sports (22 summer and 6 winter) approved by the IPC.

6. What was the vision behind the Paralympic movement?

Ans. The Paralympic movement was started by Sir Ludwig Guttmann, who believed in the power of sports to change lives for the better. He valued the ability to participate and competing spirit in sports for those with disabilities. He envisioned how they could overcome their physical limitations to the greatest extent possible, and how they could also build their self-esteem by performing well. Guttman, a Jewish German who had fled Nazi Germany and was working at the Stoke Mandeville Hospital, organised the first games for the disabled in 1948. The participants were British World War II veteran patients with spinal cord injuries. The games were given the name '1948 International Wheelchair Games'.

7. Write briefly about the ceremony of Paralympics.

Ans. The Paralympic Games Opening Ceremony is a spectacular event that marks the start of the competition. Athletes from different countries parade into the stadium carrying their national flags, and the Paralympic Flag is raised. The lighting of the Paralympic Flame symbolizes the start of the games. The Closing Ceremony celebrates the achievements of the athletes and includes the handover of the Paralympic Flag to the next host city.

8. List down the 10 disability categories, including physical, visual, and intellectual impairment recognised by the IPC.

Ans. The International Paralympic Committee (IPC) recognises 10 disability categories, including physical, visual, and intellectual impairments. These categories are used to ensure fair competition among athletes with similar disabilities. The 10 categories are:

i. Impaired muscle power: This includes athletes with limb loss or muscle weakness that affects their ability to move and control their body.

ii. Impaired passive range of movement: This category includes athletes with joint restrictions or joint fusion that limits their range of motion.

iii. Loss of limb or limb deficiency: Athletes with limb deficiency or congenital limb deficiency are included in this category.

iv. Leg length difference: This includes athletes with a significant difference in leg length, which can affect their balance and mobility.

v. Short stature: Athletes with a significant reduction in height due to a genetic condition or skeletal dysplasia are included in this category.

vi. Intellectual disability: This category includes athletes with intellectual disability, autism, or a developmental disability that affects their ability to learn and process information.

vii. Visual impairment: Athletes with varying degrees of vision loss or blindness are included in this category.

viii. Hypertonia: Hypertonia is marked by an abnormal increase in muscle tension and reduced ability of a muscle to stretch.

ix. Ataxia: Ataxia is an impairment that consists of a lack of coordination of muscle movements (For example, cerebral palsy, Friedreich's ataxia, multiple sclerosis).

x. Athetosis: Athetosis is generally characterised by unbalanced, involuntary movements and a difficulty maintaining a symmetrical posture (e.g., cerebral palsy, choreoathetosis).

These categories allow for fair and equal competition in the Paralympic Games and ensure that athletes are grouped according to their functional abilities, rather than their disability label.

9. How are the Paralympic games held?

Ans. The Paralympic Games are held every four years, following the Olympic Games. The Paralympics feature athletes with physical, visual and intellectual disabilities, and the events are organised by the International Paralympic Committee (IPC). The games consist of various sports events, including athletics, swimming, wheelchair basketball and cycling, among others. The opening ceremony of the Paralympic Games is similar to that of the Modern Olympics, following the rituals of the Antwerp Summer Olympics of 1920. First, the flag of the host nation is hoisted and the national anthem is played. This is followed by a march past of the participating nations in alphabetical order (according to the host's chosen language), with the host nation's participants entering last. After the speeches and entertainment programmes, the torch is lit.

10. What does the logo of Deaflympics signify?

Ans. The logo was designed in 2003 and symbolises a positive and powerful deaf sports community. It represents sign language, deaf and international cultures, unity and continuity. The hand shapes that are formed represent 'ok', 'good' and 'great', which overlap in a circle and together form the sign of united. The centre of the logo represents the iris of the eye, which underlines deaf people as visual people as they use their eyes to communicate. The four colours of the national flags of the world are present in the logo. These four colours, namely, red, blue, yellow and green represent the four regional confederations – the Asia Pacific Deaf Sports Confederation, the European Deaf Sports Organisation, the Pan American Deaf Sports Organisation and the Confederation of African Deaf Sports.

11. Write any four advantages of physical activities for CWSN.

Ans. Four advantages of physical activities for CWSN are as follows:

i. Physical activities, as we know by now, are also good for mental functions and emotional stability. They uplift the mood, reduce anxiety and provide relief from depression to an extent. The physically active child with disability has an improved self-esteem. She/he gains self-confidence and becomes better at social interactions.

ii. Physical activities sharpen the mind, allowing the child with disability to have enhanced cognitive skills.

iii. Physical activities are performed in an interactive environment. By taking part in such group activities, the social life of the child improves and she/he learns to establish relationships with her/his peers.

iv. Exercising helps children with special needs to avoid debilitating health conditions like obesity, high blood pressure and diabetes. Their immune system is also boosted through regular exertion.

12. Mention two strategies to make physical activities accessible for CWSN.

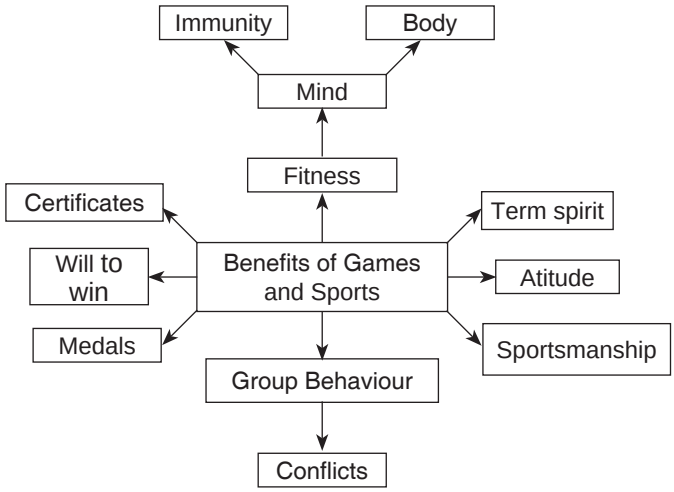
Ans. Two strategies to make physical activities accessible for CWSN are as follows:

i. District, state and national level competitions must be organised for the children with special needs, so that they can prove their potential on a regular basis.

ii. Individuals and organisations should be recognised by the society and government who are working to make accessible the physical activities and sports to the children with special needs.

13. Create a mind map including any six advantages of physical activities for children with special needs. **(CBSE SP 2022)**

Ans. Six advantages of physical activities for children with special needs



E. Long Answer Type Questions

1. Write a short note on programmes under Special Olympics across the world.

Ans. Special Olympics is a global organisation that aims to promote social inclusion, health, and fitness for people with intellectual disabilities through sports. The organization offers a wide range of programs and initiatives across the world to cater to the diverse needs of people with intellectual disabilities.

Some of the key programs under Special Olympics include:

i. Unified Sports: This program promotes social inclusion by bringing people with and without intellectual disabilities together to compete on the same team.

ii. Young Athletes: This program is designed to introduce children with intellectual disabilities to sports at an early age, helping them develop basic motor and social skills.

iii. Healthy Athletes: This program provides free health screenings and education to Special Olympics athletes to ensure their physical health and fitness.

iv. Athlete Leadership Programs: These programs are aimed at developing leadership skills and empowering athletes to take on leadership roles within their communities.

These programs not only promote physical health and fitness but also empower people with intellectual disabilities to lead fulfilling lives, build strong relationships, and contribute to their communities. They provide opportunities for socialisation, personal growth, and skill development, and are a crucial part of ensuring equal opportunities and inclusion for people with intellectual disabilities.

2. What are the sports rules followed in Special Olympics?

Ans. Following sports rules followed in Special Olympics:

Special Olympic Sports Rules : An athlete must be 8 years old to participate in Special Olympics. Also, she/he should have one of the following condition, as identified by a health professional: intellectual disability, cognitive delays as assessed by formal assessment, cognitive delay leading to significant learning or vocational problems, which requires or has required specially designed instructions.

Athletes shall be assigned to competitive sports based on their age, sex and abilities. Such a division ensures that an athlete competes against another athlete with similar ability. In the competitions, first, second and third-place winners are awarded medals and rest till eighth place are awarded ribbons.

3. Write briefly about the mission and logo of Special Olympics.

Ans. The mission of the Special Olympics is to provide sports training and organise athletic competitions in various Olympic-type sports for children and adults with intellectual disabilities throughout the year. Its aim is to provide them continuing opportunities to develop physical fitness and courage, make them experience joy and help them in sharing of skills and bonds with their families, other Special Olympics athletes and the community.

The Special Olympics logo depicts five figures in a unifying circle, symbolising our global presence.

The figures have arms in a lowered position, recalling the time when many people were unaware of the talents and abilities of adults and children with intellectual disabilities — a time before the founding of Special Olympics.

The straight arms describe greater equality and outreach. The raised arms represent 'joy', and continued realization of ultimate goals.

4. Write a note on the history of Paralympic Games.

Ans. The history of the Paralympic Games can be traced back to the Second World War when Dr. Ludwig Guttmann, a neurologist, established the Stoke Mandeville Games in 1948 for injured soldiers in Great Britain. The Games were held to promote physical activity and rehabilitation for people with disabilities. The Stoke Mandeville Games later evolved into the Paralympic Games we know today.

The first Paralympic Games were held in Rome in 1960, featuring 400 athletes from 23 countries. The games were initially only open to athletes with spinal cord injuries, but the inclusion criteria were later expanded to include athletes with other types of disabilities. Since then, the Paralympic Games have been held every four years, following the Summer and Winter Olympic Games.

The Paralympic Games have since grown in size and stature, with the most recent Games in Tokyo 2021 featuring over 4,400 athletes from 160 countries. The Paralympic Games have played a vital role in promoting disability sports and raising awareness about the capabilities and achievements of people with disabilities. The Games have also helped break down barriers and promote greater inclusion and acceptance of people with disabilities in society.

5. How does classification work under Paralympics?

Ans. Paralympic sports could have become one-sided and predictable as the least impaired athlete in the competition category would have always won. To avoid this, the competitions are designed based on the disability. There are different categories based on the severity of impairment and athletes are categorised based on these. Para athlete cannot compete in regular sports as they have disability in body structure and function. So, Paralympics are conducted and criteria are established which ensure that winning is determined by skill, fitness, endurance, power, tactical ability and mental focus.

Medical classification (until the 1980s)

From its inception until the 1980s, the Paralympic classification of athletes was based on a medical evaluation and diagnosis of impairment. An athlete's impairment was the only criterion to determine what category they competed in. It was not until views on disabled athletics shifted from just a form of rehabilitation to an end in itself, that the classification system focussed on the functional abilities of the athlete.

Functional classification (since the 1980s)

A functional classification system became the norm for disabled athletic classification in the 1980s. In a functional system, the focus is on the impact of athlete's impairment on her/his athletic performance. Under this system, athletes with a particular disability will compete together in most sports, because their functional loss is the same and the reason for the loss is immaterial.

6. Write about the history and logo of Deaflympics.

Ans. **History:** The Deaflympics are an international sports event for deaf athletes, held every four years, with both summer and winter games held alternately after a gap of two years. First held in Paris in 1924, it is the second oldest multination sports tournament. Over the years, it has gone by several other names, such as 'International Games for the Deaf ' from 1924 to 1965, the 'World Games for the Deaf ' from 1966 to 1999. The games were also sometimes referred to as 'World Silent Games'. The name 'Deaflympics' was adopted in 2001. Since its inception, it has been organised by *Comité International des Sports des Sourds* (CISS, 'The International Committee of Sports for the Deaf '). The CISS was recently renamed *'Le Comité International des Sports des Sourds'* (The International Committee of Sports for the Deaf, or ICSD). The CISS was inducted into IOC in 1955.

Logo: The logo was designed in 2003 and symbolises a positive and powerful deaf sports community. It represents sign language, deaf and international cultures, unity and continuity. The hand shapes that are formed represent 'ok', 'good' and 'great', which overlap in a circle and together form the sign of united. The centre of the logo represents the iris of the eye, which underlines deaf people as visual people as they use their eyes to communicate. The four colours of the national flags of the world are present in the logo. These four colours, namely, red, blue, yellow and green represent the four regional confederations – the Asia Pacific Deaf Sports Confederation, the European Deaf Sports Organisation, the Pan American Deaf Sports Organisation and the Confederation of African Deaf Sports.

7. What are the criteria of participating in Deaflympics?

Ans. The criteria of participating in Deaflympics are as follows:

i. Participating athletes must have a hearing loss of at least 55 decibels in their 'better ear'.

ii. Hearing aids and cochlear implants are not allowed during the competition.

iii. The athletes cannot be guided by sounds, such as bullhorns, whistles and bells. Visual tactics such as waving flags, flashing lights, etc. are used for commencing and refereeing the games.

iv. Like all other sporting events, it also enforces a drug-free sports environment for all deaf athletes in collaboration with the World Anti-Doping Agency (WADA).

v. It aims to provide deaf athletes a platform free of discrimination where they can compete under conditions of fairness and equality.

vi. Events included in Summer Deaflympics are athletics, badminton, beach volleyball, volleyball, basketball, bowling, road cycling, football, golf, handball, judo, karate, mountain biking, orienteering, shooting, swimming, table tennis, taekwondo, tennis, freestyle wrestling and Greco-Roman wrestling. Winter events include alpine skiing, cross-country skiing, curling, ice hockey and snowboarding.

In conclusion, while Special Olympics, Paralympics and Deaflympics share a common goal of promoting sports and fitness for people with disabilities, they differ in terms of eligibility criteria, events, governing, and impact. These sporting events have helped to break down barriers and promote greater inclusion and acceptance of people with disabilities in society.

8. Make a table and differentiate between Special Olympics, Paralympics and Deaflympics.

Ans. Comparison between Special Olympics, Paralympics and Deaflympics

Category	Special Olympics	Paralympics	Deaflympics
Purpose	Promotes sports and fitness for people with intellectual disabilities	Elite sporting competition for athletes with physical, sensory, or intellectual disabilities	Elite sporting competition for deaf and hard-of-hearing athletes
Eligibility	Individuals with intellectual disabilities or closely related developmental disabilities	Individuals with physical, sensory, or intellectual disabilities	Individuals who are deaf or hard-of-hearing
Governing Body	Special Olympics International	International Paralympic Committee (IPC)	International Committee of Sports for the Deaf (ICSD)
Frequency	National and international competitions throughout the year	Held every four years, following the Summer and Winter Olympic Games	Held every two years
Participants	Over 5 million athletes across 190 countries	Over 4,400 athletes from 160 countries	Over 3,500 athletes from over 100 countries
Motto	"Let me win. But if I cannot win, let me be brave in the attempt"	"Spirit in Motion"	"Per Ludos Aequalitas" (Equality Through Sport)
Logo	Features a torch with three flames representing courage, joy, and sharing, and the Latin phrase "Special Olympics"	Features three agitos (Latin for "I move"), coloured red, blue, and green, representing the Paralympic values of determination, equality, and inspiration	The centre of the logo represents the iris of the eye, which underlines deaf people as visual people as they use their eyes to communicate. The four colours of the national flags of the world are present in the logo. These four colours, namely, red, blue, yellow and green represent the four regional confederations
Impact	Promotes social inclusion and acceptance of people with intellectual disabilities	Promotes disability sports and raises awareness about the capabilities and achievements of people with disabilities	Promotes sports and cultural exchange among deaf and hard-of-hearing athletes, and raises awareness about deaf culture

9. How does participating in sports and games help CWSN?

Ans. Participating in sports and games helps CWSN in many ways. They are as follows:

i. Physical activities are a good strategy for imparting motor skills and physical fitness that children with physical or intellectual disabilities might not have due to their condition. They will be able to develop hand-eye coordination, flexibility of the body, muscle strength and endurance, increased bone density.

ii. Physical activities, as we know by now, are also good for mental functions and emotional stability. They uplift the mood, reduce anxiety and provide relief from depression to an extent. The physically active child with disability has an improved self-esteem. She/he gains self-confidence and becomes better at social interactions.

iii. Physical activities sharpen the mind, allowing the child with disability to have enhanced cognitive skills.

iv. Physical activities are performed in an interactive environment. By taking part in such group activities, the social life of the child improves and she/he learns to establish relationships with her/his peers.

v. Exercising helps children with special needs to avoid debilitating health conditions like obesity, high blood pressure and diabetes. Their immune system is also boosted through regular exertion.

10. Discuss the strategies to make physical activities accessible for CWSN.

Ans. The strategies to make physical activities accessible for CWSN are as follows:

i. All the schools must have a separate wing to admit children with special needs. Experts or trained personnel should be made available in the school on regular basis.

ii. In all clubs and community centres of different societies, provision should be made for physical activities and sports for persons with special needs with proper supervision.

iii. Society level activities should be organised for such children to uplift their lifestyle.

iv. District, state and national level competitions must be organised for the children with special needs, so that they can prove their potential on a regular basis.

v. Individuals and organisations should be recognised by the society and government who are working to make accessible the physical activities and sports to the children with special needs.

vi. Equipment should be made available at subsidised rates so that activity centres can be built-up at the society level.

vii. In all the recreational and entertainment centres, provision for participation of the CWSN should be made so that these children also feel that they are the part of the society.

viii. In total, the attitude of the people needs to be changed towards the CWSN and the concept of inclusion should develop among everyone to make activities accessible for the children with special needs.

F. Value-Based Question

Rohit joined Class 9 of a reputed school. He is little different from his other classmates as he is a CWSN. Other students notice this. He cannot play games and sports like his other classmates. So, they ignore him and play amongst themselves. The PT teacher notices this. He gathers all the students of the class including Rohit and devises a game that even Rohit can play. All the students enjoy this sports session. This becomes a norm everyday during sports period. Slowly, Rohit becomes one among the students.

Answer the following questions based on the above paragraph.

1. What was the attitude of students towards Rohit?

2. How would you reflect upon PT teacher's action?

3. What happens when CWSN are included in sports and games?

4. What happens when CWSN are excluded from sports and games?

Ans. 1. The attitude of the students towards Rohit was discriminatory and ignoring him because of his disability.

2. The PT teacher's action was positive and inclusive. By devising a game that Rohit could participate in, he ensured that everyone in the class could play together, fostering inclusion and acceptance.

3. When CWSN are included in sports and games, it promotes their physical and mental well-being, enhances their social skills and

helps them to integrate better into society. It also promotes a sense of equality, reduces isolation and discrimination, and helps to develop empathy and understanding among non-disabled individuals.

4. When CWSN are excluded from sports and games, they miss out on important opportunities for physical exercise, socialization and skill development. They may feel isolated and excluded, leading to low self-esteem and confidence. This exclusion can also promote discrimination and negative attitudes towards people with disabilities among non-disabled individuals.

CHAPTER 5

SPORTS AND NUTRITION

P. 102–107

A. Objective Type / Multiple-Choice Questions

I. Multiple-Choice Questions:

1. Which of the following points must be taken into consideration while planning a balanced diet?

(a) Age, gender and body weight

(b) Activity level and eating habits

(c) Income level and social customs

(d) All of these

Ans. (d) All of these

2. Which of the following are not macronutrients?

(a) Carbohydrates (b) Minerals

(c) Water (d) Proteins

Ans. (b) Minerals

3. Carbohydrates which are soluble in water and crystalline in structure. **(CBSE SP 2020)**

(a) Simple (b) Complex

(c) Compound (d) Complicated

Ans. (a) Simple

4. Which amongst these is not a micromineral? **(CBSE SP 2020)**

(a) Iodine (b) Magnesium

(c) Iron (d) Copper

Ans. (b) Magnesium

5. Which one of the following is a food that is high in 'fats'? **(CBSE 2020)**

(a) Orange (b) Bread

(c) Red meat (d) Tomatoes

Ans. (c) Red meat

6. The vitamins soluble in water are **(CBSE 2020)**

(a) Vitamin C and B. (b) Vitamin D and A.

(c) Vitamin K and E. (d) All of these.

Ans. (a) Vitamin C and B.

7. What is another name of riboflavin?

(a) Vitamin B (b) Vitamin B_5

(c) Vitamin B_2 (d) Vitamin C

Ans. (c) Vitamin B_2

8. The food component present in sugar is _____ **(CBSE 2020)**

(a) fats. (b) protein.

(c) vitamin. (d) carbohydrate.

Ans. (d) carbohydrate.

9. Who discovered vitamin A? **(CBSE 2020)**

(a) Dr J B Nash (b) Dr McCollum

(c) Dr Coubertin (d) Dr Harvard

Ans. (b) Dr McCollum

10. Which of the following vitamin is insoluble in fats?

(a) A (b) E

(c) K (d) C

Ans. (d) C

11. The main source of Vitamin C is _____ **(CBSE 2020)**

(a) guava. (b) egg.

(c) milk. (d) banana.

Ans. (a) guava.

12. What according to you is the main cause for night-blindness? **(CBSE SP 2021 Term 1)**

(a) Deficiency of Vitamin E

(b) Deficiency of Vitamin C

(c) Deficiency of Vitamin A

(d) Deficiency of Vitamin D

Ans. (c) Deficiency of Vitamin A

13. What is the ratio of carbon, hydrogen and oxygen in carbohydrates? **(CBSE SP 2021 Term 1)**

(a) 1 : 2 : 1 (b) 2 : 2 : 1

(c) 2 : 1 : 1 (d) 1 : 2 : 2

Ans. (a) 1 : 2 : 1

14. Which statement is not true about protein? **(CBSE SP 2021 Term 1)**

(a) Protein forms new tissues

(b) Protein regulates the balance of water and acids

(c) Protein helps in production of hormones.

(d) Protein makes antibodies.

Ans. (b) Protein regulates the balance of water and acids

15. Deficiency of which of the following leads to rickets?

(a) Iron (b) Iodine

(c) Calcium (d) Chromium

Ans. (c) Calcium

16. What is the calorific value of water?

(a) 10 joules/calorie (b) 0 joule/calorie

(c) 25 joules/calorie (d) 100 joules/calorie

Ans. (b) 0 joule/calorie

II. Match the following:

1.

	List I – Macronutrient		List II – Source
(i)	Carbohydrates	(1)	Cucumber
(ii)	Proteins	(2)	Cotton seed
(iii)	Fats	(3)	Soyabean
(iv)	Water	(4)	Colocasia

Select the correct set of options:

(a) (i)–(3), (ii)–(4), (iii)–(2), (iv)–(1)

(b) (i)–(2), (ii)–(4), (iii)–(1), (iv)–(3)

(c) (i)–(1), (ii)–(2), (iii)–(3), (iv)–(4)

(d) (i)–(4), (ii)–(3), (iii)–(2), (iv)–(1)

Ans. (d) (i)–(4), (ii)–(3), (iii)–(2), (iv)–(1)

2.

	List I – Vitamins		List II – Scientific Name
(i)	Vitamin B_{12}	(1)	Thiamin
(ii)	Vitamin B_3	(2)	Biotin
(iii)	Vitamin B_7	(3)	Cobalamin
(iv)	Vitamin B_1	(4)	Niacin

Select the correct set of options:

(a) (i)–(4), (ii)–(3), (iii)–(1), (iv)–(2)

(b) (i)–(2), (ii)–(3), (iii)–(4), (iv)–(1)

(c) (i)–(1), (ii)–(2), (iii)–(3), (iv)–(4)

(d) (i)–(3), (ii)–(4), (iii)–(2), (iv)–(1)

Ans. (d) (i)–(3), (ii)–(4), (iii)–(2), (iv)–(1)

III. Assertion-Reason Type Questions: CBQ

Given below are the two statements labelled Assertion (A) and Reason (R).

A: Even what is considered nutritious, such as carbohydrates, should be consumed in appropriate amounts.

R: A balanced diet therefore has a standard structure.

In the context of the two statements given above, which one of the following is correct?

(a) Both (A) and (R) are true and (R) is the correct explanation of (A).

(b) Both (A) and (R) are true but (R) is not the correct explanation of (A).

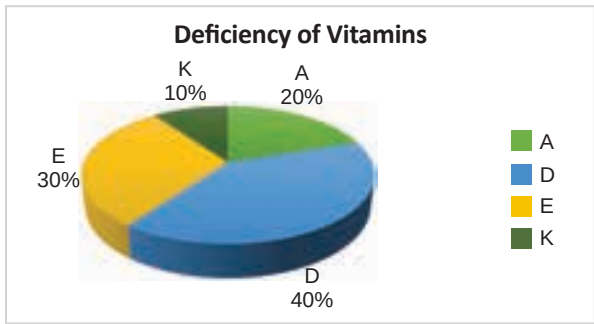
(c) (A) is true, but (R) is false.

(d) (A) is false, but (R) is true.

Ans. (c) (A) is true, but (R) is false.

IV. Data-Based Questions: CBQ

Given below is the data which depicts the percentage of school students suffering from the deficiency of various vitamins:



On the basis of the pie-chart given above, answer the following questions:

1. Which of the deficiency can be reduced by adding a morning outdoor-play-period in the timetable?

(a) Vitamin A (b) Vitamin D

(c) Vitamin K (d) Vitamin E

2. If a student has deficiency of Vitamin A, what is he likely to suffer from?

(a) Anaemia (b) Paralysis

(c) Scurvy (d) Night blindness

3. What is common about the vitamins given above in the pie-chart?

(a) They are all water soluble.

(b) They are all fat soluble.

(c) They are all fat insoluble.

(d) They all affect the immune system.

Ans. 1. (b) Vitamin D; 2. (d) night blindness; 3. (b) They are all fat soluble.

V. Picture-Based Questions: CBQ

Identify the following intramural and write their names:

1.

2.

3.

4.

Ans. 1. milk–calcium; 2. banana–potassium; 3. table salt–sodium; 4. lentils–phosphorus

VI. Case-Based Questions: CBQ

1. In relation to the picture given, answer the following questions.

(a) What type of foods is shown in the figure?

(b) These nutrients are good solvent for vitamins _____, _____, _____ and _____

(c) How are these nutrients classified?

(d) These are composed of the elements _____, _____, _____ and _____

Ans. (a) Food rich in fats

(b) A, D, E and K

(c) Saturated Fatty acids (SFA), polyunsaturated fatty acids (PUFA) and monounsaturated fatty acids (MUFA).

(d) Carbon, oxygen and hydrogen

B. Very Short Answer Type Questions

1. Define a balanced diet. **(CBSE 2014)**

Ans. A balanced diet comprises different types of foods which in total provides the body with sufficient nutrition for growth and development.

2. What do you mean by nutrition?

Ans. Nutrition means getting the right amount of nutrients for bodily functions like maintenance, growth, metabolism, repair and replacement of tissues.

3. Write briefly about macronutrients. **(CBSE 2019)**

Ans. The nutrients which are required in large amounts in the diet are known as macronutrients.

4. What are proteins? **(CBSE 2012)**

Ans. Proteins are the substances that have carbon compounds, hydrogen, nitrogen, oxygen and sometimes sulphur, phosphorus and iron.

5. Make a list of macronutrients and micronutrients.

Ans. The list of macronutrients:

- Calcium
- Magnesium
- Potassium
- Phosphorus
- Sodium

The list of micronutrients:

- Iron
- Copper
- Iodine
- Zinc
- Chromium

6. What are the nutritive components of diet? **(CBSE SP 2017)**

Ans. The nutritive components of diet are:

- Macronutrients like proteins, carbohydrates and fats.
- Micronutrients like vitamins and minerals.

7. Name any two non-nutritive components of diet. **(CBSE SP 2013)**

Ans. The two non-nutritive components of diet are:

(i) Fibre or Roughage

(ii) Water

8. What are vitamins?

Ans. Vitamins are the compounds that contribute to our energy level and boost our immune system.

9. What are the different types of vitamins?

Ans. The different types of Vitamins are:

- Fat soluble vitamins like Vitamin A, Vitamin D, Vitamin E and Vitamin K.

- Water soluble vitamins like Vitamin B complex and Vitamin C.

10. What are carbohydrates? **(CBSE 2011)**

Ans. Carbohydrates are organic compounds which are the primary sources of energy. They are also called as 'energy giving foods'.

11. What are fats? **(CBSE 2011)**

Ans. Fats are a backup energy source and are called lipids also. These are composed of the elements carbon, oxygen and hydrogen in the ratio

76 : 12 : 12.

12. Why does the weightlifter's diet include lots of proteins? **(CBSE 2018)**

Ans. Weightlifter's diet includes lots of protein. It is because:

- Proteins help in forming new tissues and repairing the broken tissues.
- To maintain strong ligaments and tendons needed for muscle growth.

13. Enlist two sources of calcium. **(CBSE 2019)**

Ans. Calcium is found in milk and milk products and dark green leafy vegetables.

14. What are fats and carbohydrates composed of?

Ans. **Fats:** These are composed of the elements carbon, oxygen and hydrogen in the ratio of 76 : 12 : 12.

Carbohydrates: These consist of carbon (Carbo-), hydrogen (hydr-) and oxygen (-ate) atoms with a hydrogen atom ratio 2 : 1 just like in water H_2O.

15. What is roughage or fibre in diet?

Ans. Roughage or fibre is the indigestible component of food found in fruits, vegetables and grains. Dietary fibre bulks up our body making it appear fuller.

C. Short Answer Type-I Questions

1. What are essential nutrients?

Ans. Essential nutrients are compounds required by the body for normal physiological function that cannot be synthesised in sufficient quantities by the body and must be obtained through diet. These include vitamins, minerals, amino acids and fatty acids.

2. What should be the proportion of proteins, fats and carbohydrates in the food?

Ans. The proportion of proteins, fats, and carbohydrates in the diet can vary depending on individual needs and goals. However, a generally recommended ratio is 10-35% of daily calories from protein, 20-35% from fat and 45-65% from carbohydrates. The proportion of proteins, fats and carbohydrates should be in the ratio 1 : 1 : 4.

3. What are the different types of macronutrients?

Ans. The four types of macronutrients are carbohydrates, proteins, fats and water. Carbohydrates are the primary energy source for the body, while proteins are important for building and repairing tissues. Fats also provide energy and play a role in hormone production and nutrient absorption. Water may not always be considered as macronutrient, but it is needed by our body in large amount.

4. What are the different types of carbohydrates?

Ans. Carbohydrates come in two main forms, i.e. simple carbohydrates and complex carbohydrates. Simple carbohydrates (monosaccharides and disaccharides) are formed by smaller chains; they are crystalline, water soluble and give food a sweet taste. Examples include glucose, fructose, galactose, sucrose, maltose and lactose. Complex carbohydrates, also known as polysaccharides, are formed by longer chains, such as starch, dextrin, glycogen and cellulose.

5. What do proteins contain?

Ans. Proteins are substances that have carbon compounds, hydrogen, nitrogen, oxygen and sometimes sulphur, phosphorus and iron. Our body converts them into amino acids as the large size of protein molecules makes it difficult for them to be used without being broken down. There are 20 amino acids out of which nine amino acids or Essential Amino Acids (EAA) must be obtained from the food we eat.

6. How are fats classified?

Ans. Fats or fatty acids are classified into saturated fatty acids (SFA), polyunsaturated fatty acids (PUFA) and monounsaturated fatty acids (MUFA). The fats present in processed foods, packaged foods, sea foods and dairy products are saturated fats.

7. What are the different types of micronutrients?

Ans. The two types of micronutrients are vitamins and minerals. Vitamins are organic compounds required in small amounts for normal physiological function, while minerals are inorganic compounds that also play important roles in the body. Both are essential for various processes such as immune function, bone health, and energy production.

8. Discuss why protein is among the most important macronutrients. **(CBSE 2020)**

Ans. Protein is among the most important macronutrients because it plays a critical role in building and repairing tissues, including muscles, bones, skin and hair. It is also involved in important bodily processes such as enzyme and hormone production, immune function and nutrient transport. Protein is also important for satiety and weight management.

9. What should be the basic nutrient in a weight lifter's diet and why? **(CBSE SP 2022)**

Ans. Protein should be the basic nutrient in a weight lifter's diet as it is essential for muscle building and repair. The body requires more protein during periods of intense physical activity, such as weightlifting, to maintain and build muscle mass. Adequate protein intake can also improve exercise performance and recovery.

10. Why is iodine important?

Ans. Iodine is important for thyroid hormone production, which regulates metabolism, growth and development. Inadequate iodine intake can lead to goiter, hypothyroidism, and impaired cognitive function, particularly in children. Iodine is found in seafood, iodised salt, and some vegetables, and is also available in supplement form.

11. Vitamins are essential for our energy levels and boost immune system. Comment. **(CBSE 2020)**

Ans. Vitamins play a crucial role in energy production by assisting in the conversion of food into usable energy. They also support immune function by helping to produce and activate immune cells and by acting as antioxidants to protect cells from damage. Adequate vitamin intake is essential for overall health and well-being.

12. What is the importance of Vitamin K?

Ans. Vitamin K is important for blood clotting, as it is required for the activation of proteins involved in the coagulation process. It also plays a role in bone metabolism and may help to prevent osteoporosis. Vitamin K is found in leafy green vegetables, oils, and some animal products.

13. Why is fibre or roughage important in our diet?

Ans. Fibre, or roughage, is important in the diet for several reasons. It helps to regulate bowel movements, prevent constipation and promote digestive health. Fibre also helps to reduce cholesterol levels, control blood sugar, and promote satiety, making it an important component of a healthy diet.

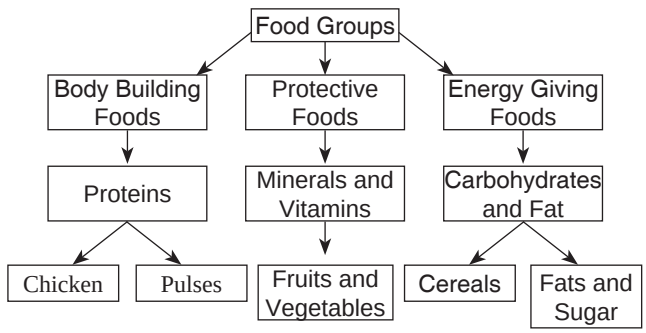
14. Nitika wants to be a model, so she went on a crash diet. Is it a right decision on her part? Why?

Ans. No, going on a crash diet is not a right decision as it can lead to a variety of health problems such as nutrient deficiencies, muscle loss and a weakened immune system. It can also lead to weight gain after the diet ends, and may not result in the desired appearance.

D. Short Answer Type-II Questions

1. Create a mind map depicting a balanced diet containing all types of required nutrients from all the food groups.

Ans. Mind map



2. Define balanced diet. Explain any four micronutrients. **(CBSE 2020)**

Ans. A diet which consists of different food types and sufficient amounts of nutrients for the development of human body is called a balanced diet. The micronutrients are: Iodine, Iron, Chromium and Copper. (See pages 94-95 of textbook)

3. How is nutrition different from food?

Ans. Foods are those substances which we eat for the sustenance of our life while nutrition concerns substances present in the food we eat which affects our body.

4. What are carbohydrates? Differentiate between its types. **(CBSE SP 2022)**

Ans. Carbohydrates are a macronutrient found in many foods such as fruits, vegetables, grains and dairy products. They provide energy to the body and are essential for optimal bodily function. There are three main types of carbohydrates simple sugars, complex carbohydrates and dietary fibre.

(i) Simple sugars are the smallest type of carbohydrate and can be quickly absorbed by the body. Examples include glucose, fructose, and sucrose.

(**ii**) Complex carbohydrates are made up of long chains of simple sugars and take longer to digest. Examples include starches found in bread, pasta, and potatoes.

(**iii**) Dietary fibre is a type of complex carbohydrate that is not digested by the body. It is important for digestive health and can be found in foods such as fruits, vegetables, and whole grains.

5. Write briefly about minerals as an important nutritive component. **(CBSE 2016)**

Ans. Minerals are very important nutritive component. Approximately 4% of our body mass is made up of minerals, which are found in an ionised state. These are broadly classified as macronutrients such as calcium, potassium, phosphorus, sodium, chlorine, magnesium and sulphur and micronutrients such as copper, iron, iodine, fluoride, cobalt, chromium, selenium and zinc.

6. Write a short note on vitamins and their types.

Ans. Vitamins contribute to our energy level and boost our immune system. They are classified into fat soluble vitamins and water-soluble vitamins.

Fat-soluble vitamins: Vitamins which dissolve in fat are called fat soluble vitamins. They are stored in the liver and fatty tissue. Vitamins A, D, E and K are fat soluble. Vitamin A is composed of hydrogen, carbon and oxygen. It is needed for new cell growth. Vitamin D is made up of carbon, hydrogen and oxygen elements. It releases parathyroid hormone which can reabsorb bone tissue, making bones thin and brittle. Vitamin K is necessary for blood clotting. It plays a vital role in cell growth.

Water - soluble vitamins: Vitamin B complex and Vitamin C are water-soluble vitamins. These are ejected from the body during urination. B complex is a group of eight water- soluble vitamins.

7. What are the different forms of Vitamin B Complex? Explain any one of them.

Ans. The different forms of Vitamin B complex are:

- Vitamin B_1: Thiamine
- Vitamin B_2: Riboflavin
- Vitamin B_3: Niacin
- Vitamin B_5: Pantothenic acid
- Vitamin B_6: Pyridoxine
- Vitamin B_7: Biotin
- Vitamin B_9: Folic acid
- Vitamin B_{12}: Cobalamin

B_{12}/Cobalamin

- It helps in protein metabolism.
- Formation of red blood cells and maintenance of central nervous system.
- Deficiency diseases like anaemia, weakness and tingling, numbness in arms and legs.
- Its food sources are low fat dairy, cheese, red meat, liver, fortified soy products and cereals.

8. Explain the role of fibre in diet.

Ans. The role of fibre in diet is as follows:

- It bulks up our body, making it appear fuller.
- It plays a role in digestion and prevents constipation.
- Two types of fibres:
  - (i) Soluble fibre, which attracts water and reduces cholesterol and brings alterations in blood sugar level,
  - (ii) Insoluble fibre, which does not dissolve in water and softens the stool, thereby bringing relief from chronic constipation.
- It lowers the risk of heart diseases and certain forms of cancer.

9. What do you understand by micronutrients? Explain the sources and role of any two macronutrients. **(CBSE 2019)**

Ans. Micronutrients are needed in small quantities though they are indispensable for our health. Commonly known micronutrients are minerals and vitamins. Their primary function is to enable chemical reactions. They are not responsible for energy production.

Sources and role of two macronutrients:

(i) ***Carbohydrates***

Sources: Cereals, pulses, dried peas, dates, potato, rice, sugar, gur, etc.

Role: Source of energy, lack of carbohydrates causes loose skin, weight loss, weakening of the body, fatigue.

(ii) ***Proteins***

Sources: Egg, fish, meat, dairy products, vegetables, pulses, soya beans, mustard, dry fruits, nuts, etc.

Role: As building blocks of life, involved in the production of hormones, enzymes, tissues and antibodies, deficiency causes marasmus, kwashiorkor diseases.

10. Discuss any three macrominerals and their importance.

Ans. The three macrominerals can be discussed as under:

(i) Phosphorus: The main source of phosphorus are meat and meat products, milk and milk products, lentils, nuts and whole grains. It maintains the bones and teeth, and also makes our gums healthy. The daily intake value for phosphorus is 1 g. Phosphorus deficiency causes hypophosphatemia, rickets in children and osteomalacia.

(ii) Magnesium: It is found in dark leafy green vegetables, nuts, leafy greens, avocados, yogurt, bananas, dried fruits and dark chocolate. Magnesium enables the proper functioning of nerves and muscles, boosts the immune system, normalise heart beat and strengthen bones.

(iii) Sodium: It is found in large amount in canned foods, fast foods, table salt, cured meat, salad dressing, pickles, instant foods etc. Sodium aids muscular activities and transmission of nerve impulse. The daily intake value for sodium is 2.3 g. Its deficiency causes hypernatremia, the symptoms of which include vomiting, nausea, muscle spasms and seizures.

11. Discuss any three microminerals and their importance.

Ans. Three microminerals and their importance:

(i) Iodine: Iodine is an important ingredient of hormones produced by the thyroid gland which are required for the growth, production of body cells, metabolism, reproduction, and maintenance of body temperature. Lack of iodine intake causes enlargement of thyroid glands. It main sources are sea food, dish and iodized salt.

(ii) Iron: Iron is required for the production of haemoglobin. The deficiency of iron causes anaemia. Red meats, fish, poultry, whole grains, dark leafy vegetables are rich in iron.

(iii) Chromium: It regulates the blood sugar levels. It is mainly found in whole grains, nuts, cheese, orange juice, potatoes, raw tomatoes, etc. Deficiency of chromium causes anxiety and fatigue. Deficiency of chromium increases the risk of diabetes.

12. Why is water important even though it is non-nutritive?

Ans. Water is important though it is non-nutritive for the reason that it serves as a transporter of nutrients to cells and removes of waste through urine. It is also crucial for control of body temperature, ionic balance of the blood as well as body's metabolism.

13. How would you differentiate between flavour compounds and colour compounds?

Ans. **Colour compounds:** It is a known fact that we like our food to have certain appetising colours. Some foods are naturally enriched with attractive colours, like fruits while others like animal products have dull, monochromatic shades. Sometimes pigments are added to lend characteristic hues.

Flavour compounds: Flavours are derived from both nutritive and non-nutritive compounds of food. Acidic content gives a sour taste like citric acid in lemons. Alkalinity meanwhile lends a bitter taste and soapy feeling to the mouth in foods.

14. How does protein act as a nutritive component of diet?

Ans. Protein containing carbon compounds, hydrogen, nitrogen, oxygen and sometimes sulphur, phosphorus and iron gets converted by our body to amino acids as the large size of protein molecules. It forms protoplasm, and is found in many physiological parts. It produces the hormones, enzymes, tissues and antibodies, regulates water and acid balance in the body, and transports oxygen and nutrients. Thus, protein acts as a very important component of food.

15. Make a table on any three vitamins under Vitamin B complex giving scientific name, approx. daily value, function, deficiency diseases and food sources.

Ans. (Take any three from the table given below.)

Vitamins	Scientific Name	Approx. Daily Value	Function	Deficiency Diseases	Food Sources
B_1	Thiamine	1.5 mg	❖ Helps in metabolising the body fat and protein ❖ Regulates important functions of cardiovascular, nervous, endocrine and digestive systems	Skin diseases, headache, nausea, fatigue, depression, loss of mental alertness, difficulty in breathing, constipation and heart damage	Nuts, oranges, eggs, seeds, liver, peas, cereals, flour and oats
B_2	Riboflavin	1.7 mg	❖ This yellow coloured vitamin has antioxidant properties. ❖ Keeps the skin healthy ❖ Participates in the production of RBCs ❖ Overcooking and exposure to sunlight tend to destroy it.	Unhealthy skin, cataracts and weakening of the immune system	Almonds, oily fish, red meat, eggs, mushrooms, sesame seed, sea food and spinach
B_3	Niacin	20 mg	❖ Vital for the digestive system, skin and for producing energy	Pellagra	Peanuts, mushrooms, tuna, liver and chicken
B_5	Pantothenic Acid	10 mg	❖ Helps in the production of hormones and cholesterol	Fatigue, insomnia and burning feet	Chicken liver, avocados, salmon, sunflower seeds, mushrooms, broccoli and corn
B_6	Pyridoxine	2 mg	❖ Helps in the synthesis of haemoglobin ❖ Keeps our immune system and nervous system healthy	Dermatitis, depression and weakened immune system	Pistachio nuts, cooked tuna, banana, spinach, sunflower seeds and bran
B_7	Biotin	30 mg	❖ Strengthens hair and nails ❖ Helps in the production of energy ❖ Produces fatty acids and amino acids	Skin changes, hair loss, confusion and nausea	Eggs, almonds, legumes, whole grains, milk and meat
B_9	Folic acid	400 mcg	❖ Required for numerous body functions, including DNA synthesis and repair, cell division and cell growth	Anaemia in adults, birth defects and heart diseases	Citrus fruits and juice, avocados, lentils, nuts, and dark green vegetables
B_{12}	Cobalamin	❖ 2.4 mcg for ages 14 years and above; 2.6 mcg for pregnant women; 2.8 mcg for breastfeeding women	❖ Helps in protein metabolism ❖ Vital for the formation of red blood cells and maintenance of central nervous system	Anaemia, weakness and tingling, numbness in arms and legs	Low fat dairy, cheese, red meat, liver, fortified soy products and cereals

16. Discuss water-soluble vitamins briefly.

Ans. Vitamin B complex and Vitamin C are water soluble vitamins. These vitamins are ejected from the body during urination. Thus, daily intake of vitamins is recommended.

- **Vitamin B Complex:** It is a group of eight water soluble B vitamins. These work alongside each other and each has its own specific benefits. Together they play a vital role in keeping and running our body like well-oiled machine.
- **Vitamin C:** It is considered one of the healthiest and safest nutrients. It comes with a broad spectrum of benefits, ranging from growth and repair of tissues, healing of wounds, production of collagen, bone and tooth formation, increasing the absorption and utilisation of iron, to lowering hypertension, curing cataracts, reducing the risk of cardiovascular diseases and controlling asthma as well as diabetes. Its deficiency may cause diseases like: scurvy, gingivitis, anaemia, fatigue, and weakness.

17. Discuss fat-soluble vitamins briefly.

Ans. These are so called because they dissolve in fat. These vitamins are stored in the liver and fatty tissues. Vitamins A, D, E and K are fat soluble.

- **Vitamin A:** It is available in different forms like retinol, renal, retinoic acid and a number of pro vitamin A carotenoids. Vitamin A is composed of hydrogen, carbon and oxygen. It is needed for new cell growth, good vision, healthy skin, hair and maintenance of immune system.
- **Vitamin D:** It is made up of carbon, hydrogen and oxygen elements. Vitamin D along with calcium helps in building bones, and keeping them strong and healthy. It also blocks the release of parathyroid hormone which can reabsorb bone tissue, making bones thin and brittle. Its deficiency causes the diseases like rickets in children, periodontitis, dental cavities and highest risk of cancer.
- **Vitamin K:** It is necessary for normal blood clotting. It plays a vital role in cell growth, metabolism of bone and other tissues, prevention of haemorrhagic disease in new born babies, heavy menstrual cycle, gum bleeding, nose bleeding, and easy bruising, defecting blood coagulation and anaemia.

E. Long Answer Type Questions

1. What is balanced diet? Elucidate its any four constituents. **(CBSE 2013)**

Ans. A balanced diet is one that consists of different food types and sufficient amounts of nutrients for the development of human body. It has not a standard structure. It should be planned according to the individual body type. There are six constituents of balanced diet like Carbohydrates, Proteins, Minerals, Vitamins, Fats and Water. It is necessary that each is consumed regularly.

The four constituents are elucidated as under:

(i) Carbohydrates are organic compounds which are the primary sources of energy. They are known as 'energy giving foods' and are made of small simple sugars that enter the body as glucose. They provide 17 kJ/g of energy. These molecules consist of carbon (carbo-), hydrogen(hydro-) and oxygen (-ate) atoms with a hydrogen oxygen atom ratio of 2 : 1 just like in water that is H_2O.

(ii) Proteins: Proteins are substances that have carbon compounds, hydrogen, nitrogen, oxygen and sometimes sulphur, phosphorous and iron. Our body converts them to amino acids as the large size of protein molecules make it bit difficult for them to be used without being broken down. Proteins are known as the building blocks of life.

(iii) Fats: These are also called lipids. These are composed of the elements carbon, hydrogen and oxygen in the ratio of 76 : 12 : 12. Fats are backup energy source.

(iv) Water: Water is made up of hydrogen and oxygen elements in the ratio of 2 : 1. It serves as a transporter of nutrients to cell and remover of waste through urine. It is also crucial for control of body temperature, ionic balance of the blood as well as the body's metabolism.

2. Explain macronutrients and their role in our diet. **(CBSE 2019)**

Ans. Nutrients that are required in large amounts in the diet are known as macronutrients, i.e. carbohydrates, proteins, fats and water. The functions of macronutrients are to provide energy, promote growth and development

and regulate body functions. Carbohydrates, proteins, fats and water which are the macronutrients are very essential for the growth of a person. Carbohydrates come in two main forms, i.e. simple carbohydrates and complex carbohydrates. Simple carbohydrates are formed by smaller chains. Carbohydrates are one of our body's dependable sources of energy.

Proteins are substances that have carbon and nitrogen compounds. Proteins are involved in the production of hormones, enzymes, tissues and antibodies, regulation of water and acid balance in the body. Fats known as lipids are a backup energy source. These are classified into saturated fats, polyunsaturated fats and monounsaturated fats. Water serves as the transporter of nutrients to cells and remover of waste through urine. It may not always be considered as macronutrient but it is needed by our body in large amount.

3. Discuss micronutrients in detail.

Ans. Micronutrients are needed in small quantities though they are indispensable for our health. Commonly known micronutrients are minerals and vitamins. Their primary function is to enable chemical reactions. They are not responsible for energy production. Approximately 4% of our body mass is made up of minerals which are found in an ionized state. The minerals present in and needed by our body are broadly classified into two types: macro minerals such as calcium, potassium, phosphorus, sodium, chlorine, magnesium and sulphur and micro-minerals such as copper, iron, iodine, fluoride, cobalt, chromium, selenium and zinc. We need 0.1 g of macrominerals and 0.01 g of trace minerals on a daily basis.

4. 'Vitamins are essential for our metabolic process.' What happens if our diet is devoid of vitamins? **(CBSE 2012)**

Ans. Vitamins serve primarily as regulators of metabolic functions, many of which are essential for improving performance of various activities. There is little evidence that vitamin enhances performance. Among the vitamins, only three vitamins are considered important, i.e. Vitamins C, E and B complex. Though excessive intake of these vitamins do not enhance the performance level, but the deficiency or the devoid of vitamins might affect the health of athletes negatively and reduce their potential.

5. Make a table discussing various types of vitamins, their functions, food sources and deficiency diseases.

Ans.

Vitamin	Function	Food Sources	Deficiency Diseases
Vitamin A	Supports vision, immune function, and skin health	Sweet potatoes, carrots, spinach, liver, eggs	Night blindness, dry skin
Vitamin B_1 (Thiamin)	Helps convert food into energy, supports nervous system function	Whole grains, legumes, nuts, pork	Beriberi, Wernicke-Korsakoff syndrome
Vitamin B_2 (Riboflavin)	Supports energy production, antioxidant function	Dairy products, leafy greens, whole grains	Ariboflavinosis
Vitamin B_3 (Niacin)	Supports energy production, nervous system function, and skin health	Meat, fish, legumes, whole grains	Pellagra
Vitamin B_6	Supports brain function, immune function, and red blood cell production	Chicken, fish, bananas, potatoes, nuts	Anemia, depression, confusion
Vitamin B_{12}	Supports red blood cell production, nerve function, and DNA synthesis	Meat, fish, dairy products, eggs	Anemia, nerve damage
Vitamin C	Antioxidant, supports immune function and wound healing	Citrus fruits, strawberries, broccoli, bell peppers	Scurvy, weakened immune system
Vitamin D	Helps with calcium absorption, bone health, and immune function	Sunlight, fatty fish, fortified dairy products	Rickets, osteomalacia
Vitamin E	Antioxidant, supports immune function and skin health	Nuts, seeds, vegetable oils, leafy greens	Anemia, muscle weakness
Vitamin K	Supports blood clotting and bone health	Leafy greens, broccoli, liver, egg yolks	Excessive bleeding, weakened bones

6. How do minerals contribute to our health? Explain citing at least four examples of each type of minerals.

Ans. Minerals play a vital role in our life. Minerals which contribute to our health are of two types:

(i) Macrominerals: Calcium, potassium, sodium, magnesium and phosphorus, and

(ii) Microminerals: Iodine, iron, chromium, copper and zinc.

7. What are fats? Write a detailed note on its types. Also mention its importance in the proper functioning of the body. **(CBSE 2012)**

Ans. Fats also called lipids are composed of the elements carbon, oxygen and hydrogen in the ratio 76 : 12 : 12. Fats are a backup energy source. They regulate the body's core temperature, boost hormone production, protect organs and are a good solvent for fat-soluble vitamin (A, D, E and K) and carotenoids. It is recommended that 20–35% of our daily energy requirement should come from fats.

Fats are classified into saturated fats, polyunsaturated fats and monounsaturated fats. The fats present in processed foods, packaged foods, sea foods and dairy products are saturated fats; these fats have the tendency to raise the level of cholesterol in the blood stream and heighten the risk of getting cardiovascular diseases. Polyunsaturated fats and monounsaturated fats on the other hand, help in lowering the blood cholesterol. Inclusion of these fats in the diet must naturally take into account which type should be struck from the list. These fats are very important for the health and can be obtained from animal sources and vegetarian sources also.

8. Write a note on the nutritive components of diet.

Ans. Nutritive components of diet consist of:

- Macronutrients: Proteins, carbohydrates and fats. (Refer to P–95-96 of the textbook)
- Micronutrients: Vitamins and minerals. (Refer to P–95-96 of the textbook)

9. Write a note on the non-nutritive components of diet.

Ans. Non-nutritive components of diet are:

- Fibre or roughage
- Water
- Colour compounds
- Flavour compounds
- Plant compounds

(For detail description refer to P–100-101 of the textbook.)

10. Write any five essential elements of diet. **(CBSE 2014)**

Ans. Essential elements of diet are:

- Carbohydrates: Carbohydrates are the major source of energy.
- Fat: It is a major nutritional element and a vital aspect of healthy diet though having a bad reputation.
- Protein: Protein plays more physiological role than other major nutrients.
- Vitamins: We need vitamins to grow and develop.
- Minerals: Minerals are required to grow and develop properly.
- Water: Water is a major nutritional element that regulates body temperature, lubricate joints and protect the major organs and tissues.

F. Value-Based Question

Naman was a Class 6 student. He used to bring junk food in his lunch box daily. His teacher observed that he was neither concentrating on his studies nor actively participating in physical activities. In this matter, he had a talk with his parents and came to know that he refuses to eat roti, dal, fruits and vegetables. Due to this, he is facing these problems. **(CBSE 2018)**

Answer the following questions based on the above passage:

1. What type of problems was Naman facing?

2. Why should junk food not to be recommended?

3. What values has his teacher shown in this matter?

Ans.

1. Naman was facing problems like lack of concentration and active participation in physical activities in his school.

2.
- Junk food does not contain the required nutrients for healthy life.
- It leads to overweight and other health problems.
- Adversely affects the growth and development.

3. Being concerned, helpful, dedicated, caring, inspiring, etc.

CHAPTER 6

TEST AND MEASUREMENTS IN SPORTS

P. 118–123

A. Objective Type/Multiple-Choice Questions.

I. Multiple-Choice Questions:

1. Which of the following abilities need to be measured for students in classes 1–3?

(a) BMI

(b) Flamingo Balance Test

(c) Plate Tapping Test

(d) All of these

Ans. (d) All of these

2. Plate Tapping Test is done to measure

(a) speed. (b) coordination.

(c) flexibility. (d) strength.

Ans. Both (a) and (b) are correct options.

3. 50 Metre Speed Test measures

(a) speed and acceleration.

(b) endurance.

(c) flexibility.

(d) muscle strength.

Ans. (a) speed and acceleration.

4. 600 m Run/Walk measures

(a) speed. (b) endurance.

(c) flexibility. (d) muscle strength.

Ans. (b) endurance.

5. Sit and Reach Test is conducted for

(a) flexibility. (b) motor fitness.

(c) endurance. (d) speed. **(CBSE 2020)**

Ans. (a) flexibility

6. Partial Curl Up Test measures

(a) flexibility.

(b) leg strength.

(c) abdominal strength and endurance.

(d) muscle strength.

Ans. (c) abdominal strength and endurance.

7. Push ups for boys measures

(a) leg muscle endurance and strength.

(b) arm muscle endurance and strength.

(c) lower body endurance and strength.

(d) upper body endurance and strength.

Ans. (d) upper body endurance and strength.

8. Which of the following fitness test items is meant exclusively for girls?

(a) Modified push ups

(b) Standing broad jump

(c) Sit and reach

(d) Partial curl up

Ans. (a) Modified push ups

9. Which of the following factors influence(s) BMR?

(a) Age (b) Weight

(c) Height (d) All of these

Ans. (d) All of these

10. Name the component which is measured by this test? **(CBSE SP 2021 Term 1)**

(a) Endurance (b) Speed

(c) Flexibility (d) Coordinative ability

Ans. (c) Flexibility

11. How many tests are there in Senior Fitness test?

(a) Five (b) Seven

(c) Six (d) Three

Ans. (c) Six

12. What is the test duration for the Arm curl test? **(CBSE SP 2021 Term 1)**

(a) 1 min

(b) 2 min

(c) 30 sec

(d) Number of repetitions

Ans. (c) 30 sec

13. Which test is used to test the functional ability amongst senior citizens? **(CBSE SP 2021 Term 1)**

(a) Rockport one mile test

(b) Harvard step test

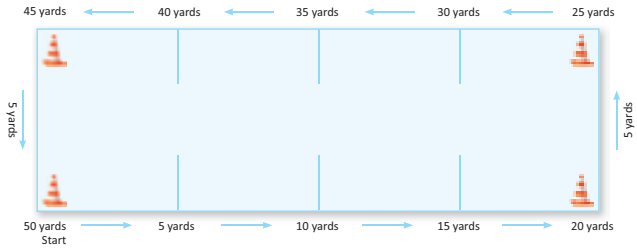
(c) Rikli and Jones test

(d) Fitness Index score

Ans. (c) Rikli and Jones test

14. Identify the test for which this pattern is followed:

(CBSE SP 2021 Term 1)



(a) 600 metres (b) 50 yard dash

(c) 400 metres (d) 6 min walk

Ans. (d) 6 min walk

15. Which of the six tests designed by Rikli and Jones for senior citizens is meant to test speed and balance while moving?

(a) Arm curl test

(b) Chair sit and reach test

(c) Eight foot up and go test

(d) Back scratch test

Ans. (c) Eight foot up and go test

16. What component of senior citizens' fitness is tested by the Six Minute Walk Test?

(a) Lower body strength

(b) Upper body strength

(c) Balance

(d) Endurance

Ans. (d) Endurance

17. In Eight Foot Up and Go Test, the person stands and walks …… feet and sits back quickly.

(a) 10 (b) 12

(c) 14 (d) 16

Ans. (d) 16

II. Match the following:

1.

	List I – Test		List II – Measure
(i)	50 m Speed Test	(1)	Coordination
(ii)	Plate Tapping Test	(2)	Flexibility
(iii)	Partial Curl Up	(3)	Speed and acceleration
(iv)	Sit and Reach Test	(4)	Abdominal strength and endurance

Select the correct set of options:

(a) (i)–(3), (ii)–(1), (iii)–(4), (iv)–(2)

(b) (i)–(2), (ii)–(4), (iii)–(1), (iv)–(3)

(c) (i)–(1), (ii)–(3), (iii)–(4), (iv)–(2)

(d) (i)–(4), (ii)–(3), (iii)–(2), (iv)–(1)

Ans. (a) (i)–(3), (ii)–(1), (iii)–(4), (iv)–(2)

2.

	List I		List II
(i)	Chair stand test	(1)	Lower Body strength
(ii)	Arm curl test	(2)	Aerobic Endurance
(iii)	Back scratch test	(3)	Upper body strength
(iv)	Six minute walk test	(4)	Upper body flexibility

Select the correct set of options:

(a) (i)–(1), (ii)–(3), (iii)–(4), (iv)–(2)

(b) (i)–(2), (ii)–(3), (iii)–(1), (iv)–(4)

(c) (i)–(1), (ii)–(3), (iii)–(2), (iv)–(4)

(d) (i)–(2), (ii)–(3), (iii)–(4), (iv)–(1)

(CBSE SP 2022)

Ans. (a) (i)–(1), (ii)–(3), (iii)–(4), (iv)–(2)

III. Assertion-Reason Type Questions: CBQ

Given below are the two statements labelled Assertion (A) and Reason (R).

A: The Fullerton Functional Fitness Test is an expensive method of assessing the physical traits that senior citizens need in order to carry out their occasional activities.

R: It is a tool to measure the functional fitness of senior citizens by using six parameters.

In the context of the two statements given above, which one of the following is correct?

(a) Both (A) and (R) are true and (R) is the correct explanation of (A).

(b) Both (A) and (R) are true but (R) is not the correct explanation of (A).

(c) (A) is true, but (R) is false.

(d) (A) is false, but (R) is true.

Ans. (d) (A) is false, but (R) is true.

IV. Data-Based Questions: CBQ

Recommended ranges for eight foot up and go test for male is shown in the following table.

Norms for Male (in Seconds)			
Age	**Below Average**	**Average**	**Above Average**
60–64	> 5.6	5.6 to 3.8	< 3.8
65–69	> 5.7	5.7 to 4.3	< 4.3
70–74	> 6.0	6.0 to 4.2	< 4.2
75–79	> 7.2	7.2 to 4.6	< 4.6
80–84	> 7.6	7.6 to 5.2	< 5.2
85–89	> 8.9	8.9 to 5.3	< 5.3
90–94	> 10.0	10.0 to 6.2	< 6.2

On the basis of the chart given above, answer the following questions:

1. If a male senior citizen of 65 years completes two trials in the eight foot up and go test in 4.6 and 4.4 seconds respectively, his agility will be determined as

(a) Below average. (b) Average.

(c) Above average. (d) Extremely poor.

Ans. (b) Average

2. If a senior citizen (male) of 78 years completes two trials in the eight foot up and go test in 7.6 and 7.8 seconds respectively, his agility will be determined as

(a) Below average. (b) Average.

(c) Above average. (d) Extremely poor.

Ans. (a) Below average.

3. If the average of two trials of a male senior citizen aged 82 years in the eight foot up and go test is 7.9 seconds, his agility score will be considered as

(a) Below average. (b) Average.

(c) Above average. (d) Extremely poor.

Ans. (a) Below average.

V. Picture-Based Questions: CBQ

1. Identify the following fitness test items and name them:

(a) 

.....

(b) 

.....

(c) 

.....

(d) 

.....

Ans. (a) Plate tapping test

(b) Sit and reach test

(c) Flamingo balance test

(d) Partial curl up test

2. Identify the odd one.

(a) 

.....

(b) 

.....

(c) 

.....

(d) 

.....

Ans. (a) Chair Stand Test;

(b) Chair Sit and Reach Test;

(c) Modified Push-ups;

(d) Arm Curl Test

VI. Case-Based Questions: CBQ

1. Arm Curl Test was conducted on 5 individuals in the age group 60–64 years and the data collected indicated that 3 people fell in the below average category.

On the basis of the case given, answer the following questions:

(a) What would have been the average range?

(b) What is the advantage of this test?

(c) What is the duration of this exercise?

(d) The total number of arm curls performed in the above duration is called a ……

Ans. (a) 16 to 22 for men and 13 to 19 for women

(b) To assess the strength of upper body of senior citizen

(c) 30 seconds

(d) Score

2. Observe the given figure and answer the following questions.

(a) Which test has been shown in the figure?

(b) What does it measure?

(c) Lying down, the knees of the student are bent at an angle of _____

(d) The duration of a complete test is _____ seconds.

Ans. (a) Partial curl up test

(b) The abdominal strength and endurance

(c) 90 degrees

(d) 30 seconds

B. Very Short Answer Type Questions

1. Name the SAI Khelo India Fitness tests for age group 5 – 8 years.

Ans. The SAI Khelo India Fitness tests for age group 5 – 8 years are as follows:

i. Body Mass Index test

ii. Flamingo Balance test

iii. Plate Tapping test

2. Name the SAI Khelo India Fitness tests for age group 9 – 18 years.

Ans. The SAI Khelo India Fitness tests for age group 9 – 18 years are as follows:

i. Body Mass Index test

ii. 50 m speed test

iii. 600 m Run /walk test

iv. Sit and reach test

v. Partial curl up

vi. Push ups for boys and modified push ups for girls

3. Which component is measured through sit and reach test?

Ans. Flexibility

4. What is the purpose of push ups (boys) fitness test?

Ans. To test or measure the upper body endurance and strength.

5. What is the purpose of modified push ups (girls) fitness test?

Ans. To test or measure the upper body endurance and strength.

6. Name the tests devised by Rikli and Jones to determine fitness of senior citizens.

Ans. Rikli and Jones – Senior Citizen Fitness Test

i. Chair Stand Test for lower body strength

ii. Arm Curl Test for upper body strength

iii. Chair Sit and Reach Test for lower body flexibility

iv. Back Scratch Test for upper body flexibility

v. Eight Foot Up and Go Test for agility

vi. Six Minute Walk Test for Aerobic Endurance

7. Your grandmother feels that she has reduced her upper flexibility and therefore she wants to test herself. Which test would you suggest to her? **(CBSE 2015, 2017)**

Ans. The test I would suggest to her is 'Arm curl test' for upper body strength.

8. Which test would you suggest for your grandmother to test lower body flexibility? **(CBSE 2015)**

Ans. I would suggest grandmother for 'Chair Stand Test' to measure lower body flexibility.

9. Which motor quality does a senior citizen lack who finds difficulty in tying the shoe laces while sitting on the chair? **(CBSE SP 2015)**

Ans. The senior citizen who finds difficulty in tying the shoe laces lacks the lower body flexibility.

10. Which test would you suggest to measure upper body strength for aged population? **(CBSE 2016)**

Ans. I would suggest to measure upper strength for aged population test named 'Arm curl test for upper body strength'.

C. Short Answer Type–I Questions

1. How is BMI calculated?

Ans. BMI, or Body Mass Index, is calculated by dividing a person's weight in kilograms by their height in meters squared. The formula is BMI = weight (kg) / height (m^2). It is a common tool used to estimate body fat and assess health risks associated with weight.

2. Which equipment are used to measure height and weight during BMI measurement?

Ans. The equipment commonly used to measure height during BMI measurement is a stadiometer,

which is a ruler or rod attached to a wall or a standalone device that measures height in centimetres. The equipment used to measure weight is a scale, which can be mechanical or digital and measures weight in kilograms or pounds.

3. Write down the objectives and administration of the Flamingo Test. **(CBSE SP 2022)**

Ans. The Flamingo balance test is a tool used to assess an individual's ability to maintain balance. The objective of the test is to assess postural sway and balance control. During the test, the participant stands on one leg on a beam. The total number of falls or loss of balance in 60 seconds of balancing is recorded.

4. How is scoring done in Flamingo Balance Test?

Ans. In Flamingo Balance test, the number of falls in 60 seconds of balancing is counted. If there are more than 15 falls in the first 30 seconds, the test is terminated. The total number of falls or loss of balance in 60 seconds of balancing is recorded.

5. What is the purpose of doing Plate Tapping Test?

Ans. To test the speed and coordination of limb movement.

6. Which equipment are needed in Plate Tapping Test?

Ans. Table (adjustable height), 2 yellow discs (10 cm radius), rectangle (30 × 20 cm), stopwatch

7. Write the formula for calculating BMR.

Ans. To calculate BMR, the Harris–Benedict formula or Mifflin-St Jeor formula is used. The Harris–Benedict equation was revised by Mifflin and St Jeor in 1990: Men: BMR = (10 × weight in kg) + (6.25 × height in cm) – (5 × age in years) + 5 Women: BMR = (10 × weight in kg) + (6.25 × height in cm) – (5 × age in years) – 161

8. What are the factors that influence BMR?

Ans. Age, weight, height, gender, genetics, body composition, exercise, food habits, environmental temperature, etc. are the factors that influence the BMR of a person.

9. What are the rules for conducting Partial Curl Up Test?

Ans. The partial curl-up test is conducted to assess an individual's abdominal muscle endurance. The rules for conducting this test include lying on the back with knees bent, feet flat on the floor, arms crossed over the chest, and performing a curl-up until the elbows touch the knees. The test is repeated at a set pace, and the number of repetitions completed correctly is recorded.

Scoring: Record the maximum possible number of curl ups in the given time (30 seconds).

10. Which six parameters are used to measure the functional fitness of senior citizens?

Ans. The six parameters used to measure the functional fitness of senior citizens include aerobic endurance, muscular strength, muscular endurance, flexibility, body composition and balance. These parameters assess the ability of seniors to perform daily activities independently, maintain mobility, and reduce the risk of falls and other health complications associated with aging.

11. A senior citizen wants to improve his speed and balance. Which test would you recommend? How would you administer it?

Ans. I would recommend the Eight Foot Up and Go test to improve the senior citizen's speed and balance. To administer the test, the participant stands up from a chair, walks 8 foot, turns, walks back to the chair and sits down. The time taken to complete the test is recorded. The test assesses mobility, balance and gait speed. The senior citizen can perform the test once a day or as recommended by their healthcare provider.

D. Short Answer Type–II Questions

1. Write the steps of Plate Tapping Test.

Ans. Refer to page 109 of the book

2. Write briefly about 50 m Standing Start or Dash.

Ans. Refer to page 110 of the book

3. Write briefly about Sit and Reach Test.

Ans. Refer to page 110 of the book

4. What is the procedure of modified push ups for girls?

Ans. **The procedure of modified push-ups for girls:** The push-up begins in a kneeling position, with the hands and knees touching ground. The knees are kept slightly apart; the arms are at shoulder width apart, extended and at a right angle to the body. Keeping the back straight and holding core tight, the student has to lower the body until there is a 90-degree angle at the elbows, then returns to the starting position with the arms extended. The action is repeated until exhaustion or until the time limit is reached. In case of timed tests, the maximum number of correct push-ups performed are noted.

5. Write the main difference between push ups for boys and modified push ups for girls.

Ans. In case of boys push-up begins with the hands and toes touching the ground, and the body and legs in a straight line. But in case of girl the push-up begins in a kneeling position, with the hands and knees touching ground. The knees are kept slightly apart; the arms are at shoulder width apart, extended and at a right angle to the body.

In boy push-ups, the back and knees are kept straight. The student has to lower the body until there is a 90-degree angle at the elbows, then returns to the starting position with the arms extended.

In girl push-ups, the back is kept straight and core tight. The student has to lower the body until there is a 90-degree angle at the elbows, then returns to the starting position with the arms extended.

6. What are the factors on which the BMR of a person depends?

Ans. Basal metabolic rate (BMR) refers to the number of calories the body burns at rest to perform essential functions such as breathing, circulating blood and maintaining body temperature. BMR varies among individuals and is influenced by several factors, including age, sex, body size and composition, hormonal imbalances, genetics, diet, and physical activity level. Individuals with higher muscle mass and active lifestyle have a higher BMR, while those with sedentary lifestyle, low muscle mass, or hormonal imbalances have a lower BMR. Aging and certain medical conditions can also affect BMR. Measuring BMR can provide insight into the body's energy needs, and help with weight management and nutritional planning.

7. Make a table calculating the AMR of individuals depending on their daily activity/exercise regime.

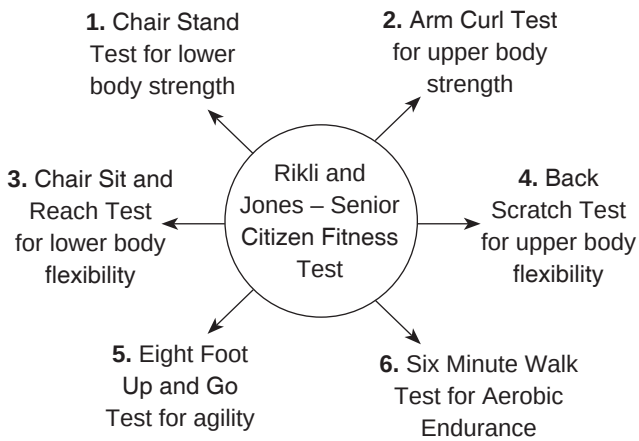
Ans. AMR, or the total daily energy expenditure, is the sum of an individual's BMR and the calories expended through physical activity. The daily activity/exercise regime plays a significant role in determining an individual's AMR. Here is an example table showing estimated AMR for different activity levels:

Activity Level	Description	Estimated AMR (calories/day)
Sedentary	Little or no exercise, desk job	BMR × 1.2
Lightly Active life	Light exercise or sports 1-3 days a week	BMR × 1.375
Moderately Active life	Moderate exercise or sports 3-5 days a week	BMR × 1.55
Active life	Hard exercise or sports 6-7 days a week	BMR × 1.725
Very Active life	Very hard exercise or sports, physical job, training 6-7 days/day	BMR × 1.9

It is important to note that these estimates are based on average values and may vary depending on individual factors such as age, sex, body composition and genetics.

8. Create a mind map on the components of Rikli and Jones Test along with their objectives.

Ans. Mind map



9. Write on at least two components included in the Rikli and Jones Test.

Ans. **CHAIR STAND TEST:**

Purpose: The purpose of this test is to test the strength of the lower body, especially the legs, which are very necessary for carrying out various daily activities like sitting down and getting up, kneeling, walking, etc.

Equipment required: A chair without arms and a straight back with seat of at least 44 cm and a stopwatch.

Procedure: The chair should be placed against a wall where it will be stable. The participant should sit in the middle of the chair with her/ his feet flat on the floor, shoulder width apart, and spine erect. She/ he should cross the arms at the wrist and place them against the chest. The participant must stand up completely from the sitting position when the test partner starts the test by using the stopwatch. This process is repeated for 30 seconds. A complete chair stand is taken from the position of sitting to position of standing up. The test partner and participant should count the total number of complete chair stands.

Scoring: The total number of completed chair stands during 30 seconds is called score. The recommended ranges for this test is based on different age groups.

ARM CURL TEST:

Purpose: The main purpose of this test is to assess the strength of the upper body. The upper body helps in performing various activities like carrying, washing, eating, stirring, writing, lifting and so on.

Equipment required: Five pound weight for women and 8 pound weight for men, a stopwatch and a straight-back chair with no arms are required for this test.

Procedure: The chair should be placed against a wall where it will be stable. The participant should sit in the middle of the chair. The dominant arm must do the arm curl. The participant holds the weight in the hand using a suitable grip. The palms should be facing towards the body. The position of the arm should be vertically downwards. It is the lower arm that has to move freely while keeping the upper arm immovable. The test partner will tell when to begin and will time for 30 seconds using a stopwatch or a watch with a seconds hand. The participant should do a full curl as many times as she/he can in the allotted 30 seconds time period moving in a controlled manner. The participant must squeeze her/his lower arm against the upper arm at the top of each curl, returning to a straight arm each time and should not swing the weight. Record the score on the scorecard.

Scoring: The total number of arm curls performed in 30 seconds of duration is called a score. The recommended ranges for this test is based on different age groups.

E. Long Answer Type Questions

1. Make a table of test items listed under fitness test by SAI (age group 9 – 18 years) along with the objectives of conducting them. Explain the administration of any one of them.

(CBSE SP 2022)

Ans. Here is a table of the SAI Khelo India Fitness tests for age group 9-18 years along with their objectives:

Test Item	Objectives
Body Mass Index test	Assesses body composition and overall health
50 m speed test	Assesses speed and agility
600m Run/walk test	Assesses cardiovascular endurance
Sit and reach test	Assesses flexibility
Partial curl up	Assesses core strength and endurance
Push-ups for boys and modified push-ups for girls	Assesses upper body strength and endurance

One of the tests listed above is the partial curl-up test. The test requires the participant to lie on their back with their knees bent, feet flat on the floor, and hands placed under their lower back. The participant then raises their head and shoulders off the ground while keeping their feet and lower back in contact with the ground. The test assesses core strength and endurance, which is essential for maintaining a healthy spine, performing physical activities that require stability, and preventing lower back injuries. It is important to ensure that the participant performs the curl-ups in a controlled manner and does not jerk or swing their upper body to avoid injury. The test continues for 1 minute, and the number of successful repetitions is recorded as the final result.

2. How is BMI measured? Explain with example.

Ans. Refer to pages 108-109 of the book.

3. Write in detail about Flamingo Balance Test.

Ans. Refer to page 109 of the book.

4. How is BMR computed? Describe various formulas to find out AMR using BMR values.

Ans. BMR (Basal Metabolic Rate) is the amount of energy required to maintain essential body functions such as breathing, heartbeat, and body temperature at rest. It is usually expressed as the number of calories burned per day.

There are several formulas to calculate BMR, including the Harris-Benedict equation and the Mifflin St. Jeor equation. These formulas take into account factors such as age, gender, height and weight.

Once BMR is determined, AMR (Active Metabolic Rate) can be calculated by multiplying BMR by an activity factor, which represents the level of physical activity. The activity factor can range from 1.2 for sedentary individuals to 1.9 for very active individuals.

Here are some formulas to calculate AMR using BMR:

- Sedentary: BMR × 1.2

- Lightly active: BMR × 1.375
- Moderately active: BMR × 1.55
- Active: BMR × 1.725
- Very active: BMR × 1.9

For example, if a sedentary individual has a BMR of 1500 calories per day, their AMR would be 1800 calories per day (1500 × 1.2). These formulas can be used to estimate the number of calories required for daily activities and weight management.

5. Write in detail about Push ups for boys and Modified Push ups for girls bringing out their differences as well.

Ans. Refer to page 111 of the book.

6. Write about any three tests that are conducted under Rikli and Jones Test.

Ans. Refer to pages 112-117 of the book.

7. Mention the purpose of all the tests that are conducted under Rikli and Jones Test.

Ans. Refer to pages 112-117 of the book.

8. How are upper body strength and lower body strength measured in senior citizens?

Ans. Upper body strength is measured using the arm curl test, and lower body strength is measured using the chair stand test. Refer to pages 112-114 of the book.

F. Value-Based Question

Every morning Akanksha goes to the park near her home. She noticed that many senior citizens have some or the other type of fitness problems in terms of flexibility and strength. She decided to check the fitness level of each person in the park.

Answer the following questions based on the above passage:

1. Explain the tests used by Akanksha for measuring the fitness of the people.

2. What values are depicted by Akankska in this question?

Ans.

1. The tests used by Akanksha for measuring the fitness of the people are:

- Chair stand test: testing lower body strength.
- Arm curl test: testing upper body test.
- Chair sit and reach test: lower body flexibility test.
- 8 Foot up and go test: agility test.
- Walk test (6 min) or step in place test (2 min)

This test is used to assess fitness.

2. The values shown by Akanksha that she is very

CHAPTER 7

PHYSIOLOGY AND INJURIES IN SPORTS

P. 141–147

A. Objective Type/Multiple-Choice Questions

I. Multiple-Choice Questions:

1. Slow twitch fibres are _____ in colour. **(CBSE SP 2022)**

(a) white (b) red

(c) transparent (d) brown

Ans. (b) red

2. What is the possible range of movement in a joint or a series of joints called?

(a) Flexibility

(b) Explosive strength

(c) Mobility

(d) Muscle composition

Ans. (a) Flexibility

3. Which of these acids gets accumulated in the muscles during intense physical activity?

(a) Citric acid (b) Lactic acid

(c) Nitric acid (d) Acetic acid

Ans. (b) Lactic acid

4. Which of these terms refers to the air that moves in and out of the lungs with each breath in a normal restive mode?

(a) Second wind (b) Vital air

(c) Tidal air (d) Residual wind

Ans. (c) Tidal air

5. Increase in size of lungs and chest is one of the process of adaptions that our _____ system undergoes when we exercise regularly for a long-time.

(a) respiratory (b) cardiovascular

(c) cardio-respiratory (d) none of these

Ans. (c) cardio-respiratory

6. What is cardiac output? **(CBSE 2020)**

(a) Blood pumped in one minute

(b) Blood pumped in one beat

(c) Blood pumped in one stroke

(d) None of these

Ans. (a) Blood pumped in one minute

7. The amount of oxygen of which can be absorbed and consumed by the working muscles from the blood is called _____ **(CBSE SQP 2022)**

(a) oxygen uptake (b) oxygen intake

(c) oxygen transport (d) vital capacity

Ans. (a) oxygen uptake

8. Joint structure, age and gender, internal environment and previous injury are the physiological factors that determine _____

(a) endurance. (b) speed.

(c) flexibility. (d) strength.

Ans. (b) speed

9. Which of the categories fall under classification of sports injuries?

(a) Direct and Indirect Injury

(b) Overuse Injury

(c) Underuse Injury

(d) Only (a) and (b)

Ans. (d) Only (a) and (b)

10. In what type of fracture do bones break into three or more pieces, seen often in cycling and motorcycling?

(a) Oblique fracture

(b) Green stick fracture

(c) Comminuted fracture

(d) Compound fracture

Ans. (c) Comminuted fracture

11. When the bone is broken into more than one piece, it is called **(CBSE 2020)**

(a) comminuted fracture.

(b) compound fracture.

(c) simple fracture.

(d) greenstick fracture.

Ans. (a) comminuted fracture

12. How many types of fractures are classified under bone injuries?

(a) Seven (b) Nine

(c) Six (d) Four

Ans. (b) Nine

13. In which of the following sports does the joint injuries occur?

(a) Football (b) Hockey

(c) Volleyball (d) All of these

Ans. (d) All of these

14. PRICE treatment is for **(CBSE 2020)**

(a) fractures. (b) abrasions.

(c) sprains. (d) lacerations.

Ans. (c) sprains

II. Match the following:

1.

List I – Component of Physical Fitness		List II – Physiological Factor	
(i)	Strength	(1)	Nervous System Mobility
(ii)	Speed	(2)	Point of Tendon Insertion
(iii)	Endurance	(3)	Oxygen Intake
(iv)	Flexibility	(4)	Age and Gender

Select the correct set of options:

(a) (i)–(3), (ii)–(4), (iii)–(2), (iv)–(1)

(b) (i)–(2), (ii)–(1), (iii)–(3), (iv)–(4)

(c) (i)–(1), (ii)–(3), (iii)–(4), (iv)–(2)

(d) (i)–(4), (ii)–(3), (iii)–(2), (iv)–(1)

Ans. (b) (i)–2; (ii)–1; (iii)–3; (iv)–4

2.

List I		List II	
(i)	Abrasion	(1)	Joint Injury
(ii)	Green Stick Fracture	(2)	Soft Tissue Injury
(iii)	Shoulder Dislocation	(3)	Cause of Sports Injury
(iv)	Lack of Fitness	(4)	Bone Injury

Select the correct set of options:

(a) (i)–(2), (ii)–(4), (iii)–(1), (iv)–(3)

(b) (i)–(3), (ii)–(2), (iii)–(4), (iv)–(1)

(c) (i)–(4), (ii)–(3), (iii)–(1), (iv)–(2)

(d) (i)–(1), (ii)–(3), (iii)–(2), (iv)–(4)

Ans. (a) (i)– 2; (ii)–4; (iii)–1; (iv)–3

III. Assertion-Reason Type Questions: CBQ

Given below are the two statements labelled Assertion (A) and Reason (R).

A: The cardio-respiratory system regulates the vital processes of supplying our body with nutrients, cellular waste, hormones and O_2 for its smooth functioning.

R: When we exercise, the body demands more O_2 and nutrients. So, the heart operates harder to pump more blood throughout the body to meet the increased demands.

In the context of the two statements given above, which one of the following is correct?

(a) Both (A) and (R) are true and (R) is the correct explanation of (A).

(b) Both (A) and (R) are true but (R) is not the correct explanation of (A).

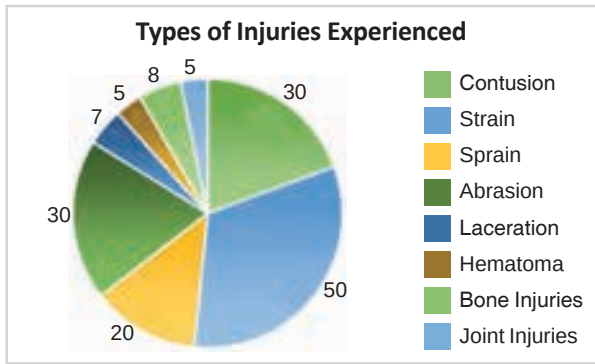
(c) (A) is true, but (R) is false.

(d) (A) is false, but (R) is true.

Ans. (b) Both (A) and (R) are true but (R) is not the correct explanation of (A).

IV. Data-Based Questions: CBQ

A survey was conducted in a sports academy on the kind of injuries that the athletes/sports persons experienced:



On the basis of the chart given above, answer the following questions:

1. Strain being the most common type of injury; how is it classified further?

(a) Into three degrees

(b) Into five sub-categories

(c) Into seven styles

(d) Into four types

2. The sports persons who experienced laceration could possibly be training in .....

(a) wicket keeping (b) boxing

(c) skating (d) tennis

3. What do bone injuries include?

(a) Fractures

(b) Dislocation of jaw and wrist

(c) Tissue damages

(d) Dislocation of hip and shoulder

Ans. 1. (a) Into three categories; 2. (c) Skating; 3. (a) Fractures

V. Picture-Based Questions: CBQ

Identify the following types of fractures and name them:

1. 

.....

2. 

.....

3. 

.....

4. 

.....

Ans. **1.** Transverse Fracture; **2.** Comminuted Fracture; **3.** Oblique Displaced Fracture; **4.** Greenstick Fracture

VI. Case-Based Questions: CBQ

1. While playing badminton, Radhika accidentally bumped against the pole and suffered contusion. On the basis of the case given, answer the following questions:

(a) What type of injury is contusion?

(b) What gets ruptured?

(c) The affected area becomes _____ , then _____ and then _____

(d) The affected area also _____ due to leakage of blood and fluids.

Ans. (a) Muscle injury

(b) Blood vessels

(c) red, blue, purple

(d) swells

2. Look at the given figure and answer the following questions:

(a) Which type of dislocation is shown here?

(b) Dislocation is a type of _____ injury.

(c) Why are such injuries of a grave nature?

(d) In the dislocation shown, the head of the _____ is forced out of its _____in the _____

Ans. (a) Hip dislocation

(b) joint

(c) Such injuries are of a grave nature as the joints and the bones they connect tend to get disconnected.

(d) thigh bone, socket, pelvis

B. Very Short Answer Type Questions

1. What is stroke volume? **(CBSE 2016)**

Ans. Stroke volume is the amount of blood ejected per beat from the left ventricle.

2. Which type of muscle fibres determine strength?

Ans. Muscles with higher percentage of fast-twitch fibres determine strength.

3. What role does the nervous system play with regard to the speed of an athlete?

Ans. The nervous system excites and inhibits the motor centres associated with contraction and relaxation of the related muscles at the highest possible speed. This process is called mobility of the nervous system enables these excitations and inhibitions, tension spreads all over the body due to the activity. Consequently, the speed decreases. This mobility is greatly affected by genetics and can be trained only to a certain degree.

4. Suggest any two physiological factors determining speed.

Ans. Mobility of the nervous system and muscular composition are the two factors that determine speed.

5. What is the relationship between explosive strength and speed? **(CBSE 2019)**

Ans. Explosive strength is the ability to produce a strong muscle force within a very limited time at a fast pace, as in sports activities or regaining our balance when we are about to fall. In addition to the individual's metabolic process, the composition, size and coordination of muscles together determine explosive strength. All these factors can be enhanced with training to improve speed up to a certain degree, obviously with the exception of muscle composition.

6. Name the energy storage compounds found in the muscular tissues.

Ans. The high-energy phosphates in the storage composition, size and coordination of muscles together determine explosive strength.

7. What do you mean by aerobic capacity? **(CBSE 2016)**

Ans. The ability to sustain an activity for a length of time using the energy derived from oxygen consumption is one of the crucial factors which determines endurance. In other words, aerobic capacity is the functional capacity of the body to supply sufficient amount of O_2 to the muscles for generation of energy.

8. Define explosive strength. **(CBSE 2013)**

Ans. Explosive strength is the ability to produce a strong muscle force within a very limited time at a fast pace, as in sports activities or regaining our balance when we are about to fall in.

9. What is oxygen uptake? **(CBSE 2017)**

Ans. It is the amount of O_2 which can be extracted from the blood by the muscles for consumption.

In other words, it is the amount of O_2 diffused from capillaries to mitochondria present in tissues.

10. How does muscular strength influence flexibility?

Ans. Body movements especially against gravity or external forces are possible if the associated muscles are strong enough to make the movements. Therefore, muscular strength is a determinant factor for flexibility. Weak muscles deter the range of motion. Muscular strength can be highly developed with training to upgrade flexibility.

11. What do you know about the term cardiac output? **(CBSE 2018)**

Ans. The amount of blood (in litres) pumped by the heart in one minute is called cardiac output.

12. Explain the term hypertrophy of muscles.

(CBSE 2015)

Ans. Hypertrophy is an increase in the thickness of an individual's muscle fibre. Generally, it is called an increase in size of muscle.

13. Why is increasing internal body heat important for flexibility?

Ans. **Internal environment:** Joints and muscles are more flexible at body temperatures that are 1–2 °C higher than the normal. So, flexibility is also affected by the internal environment. For instance, exposure to a warm bath increases body temperature leading to an increase in flexibility. On the contrary, exposure to cold temperature reduces it. Generally, the body tends to be more flexible in the afternoon than in the morning.

14. What is vital air capacity?

Ans. It is the amount of air which can be inhaled and expelled with maximum force that an individual is capable of.

15. Why does the colour of muscles change after exercising?

Ans. After exercising, new capillaries are formed in order to raise the level of blood circulation for sufficient energy supply and this changes the colour of the muscles.

16. What is direct injury?

Ans. A direct injury is an injury incurred where the body makes contact with an external force. Some examples of direct injuries are broken bones, bruises, abrasions, blisters, dislocations, etc.

17. What is indirect injury?

Ans. An indirect injury an injury caused by forces inside the body like excess strain on muscles and ligaments. Some examples of indirect injury are pulled hamstring, sprained ankle, muscle sprains, etc.

18. What is overuse injury?

Ans. An overuse injury occurs when specific parts of our body are used over a period of time, especially when the movements are repetitive.

19. What is soft tissue injury? **(CBSE 2019)**

Ans. Soft tissue injuries can be direct like a blister or bruise at the site of external force or they can be indirect injuries caused by internal forces such as a strain or sprain, for example, sprained ankle.

20. Mention the various types of soft tissue injury.

(CBSE SP 2016)

Ans. Contusion, strain, sprain, abrasion, laceration, incision, hematoma are the types of soft tissue injury.

21. What is bone injury? What are the types of bone injury?

Ans. Bone injuries are fractures caused by forces or pressures greater than the strength of the osseous (Connective) tissue. The different types of bone injuries are:

- **i.** Simple fracture
- **ii.** Compound fracture
- **iii.** Complicated fracture
- **iv.** Stress fracture
- **v.** Green stick fracture
- **vi.** Comminuted fracture
- **vii.** Impacted fracture
- **viii.** Transverse fracture
- **ix.** Oblique fracture

22. What type of fracture is known as 'Green Stick Fracture'? **(CBSE 2018)**

Ans. Bending of bones or a slight crack is called green stick fracture. Children are more vulnerable to this type of fracture due to underdeveloped bones.

23. What type of injuries are laceration and incision? Explain. **(CBSE 2019)**

Ans. Laceration is the tearing of skin which results in an irregular cut. It is caused of injury with a sharp sports equipment. Incision is a smoothly-cut skin wound made by a sharp sport equipment, spike, etc.

24. Which type of sports injury is known as strain?

(CBSE 2019)

Ans. Strains are caused by excessive use or forced stretching of the muscles or tendons. There may be complete tearing of muscles or tendons. Strains are common in contact sports such as boxing, football, hockey, wrestling, etc.

25. What is joint injury? What are the types of joint injury?

Ans. Joint injuries usually occur in contact sports such as football, hockey, volleyball, gymnastics, etc. They tend to be of grave nature as the joints and the bones they connect tend to get disconnected. The different types of joint injuries are:

i. Dislocation of the jaw

ii. Dislocation of the shoulder joint

iii. Dislocation of hip joint

iv. Dislocation of the wrist

26. What type of sports injury is contusion?

(CBSE 2016)

Ans. Contusion is a muscle injury caused by a blow to the skin, such as getting hit or bumping against something which leads to ruptured blood vessels. The affected area becomes red, then blue and then purple.

27. What are PRICE and MICE in treatment of sports injuries?

Ans. PRICE stands for Protection, Rest, Ice, Compression and Elevation. PRICE procedure is an effective method to apply during the first 24–48 hours after injury. MICE stands for Mobilisation, Ice, Compression and Elevation. After the symptoms of inflammation subside, the procedure of MICE should be followed until the injury is healed.

28. What kind of sports injury can be termed as 'abrasion'? **(CBSE 2016)**

Ans. Abrasion is a superficial injury to the skin when something rubs against it. It does not penetrate deeper than the epidermal layer of the skin. Friction between skin and hard or rough surface leads to abrasion.

C. Short Answer Type-I Questions

1. Mention any three physiological factors determining speed.

Ans. The three physiological determinants of speed are:

- **Mobility of the nervous system:** The nervous system excites and inhibits the motor centres associated with contraction and relaxation of the related muscles at the highest possible speed. This process is called mobility of the nervous system. After the limited few seconds during which the nervous system enables these excitations and inhibitions, tension spreads all over the body due to the activity. Consequently, the speed decreases. This mobility is greatly affected by genetics and can be trained only to a certain degree.
- **Muscle composition:** Muscles with higher percentage of fast-twitch fibres contract with greater speed than those with a low percentage. Genetics determine their percentage and so it cannot be altered by any amount of training. Also, fast-twitch fibres exist in varying quantities in different types of muscles. That is why, different parts of the body react with different speeds.
- **Flexibility:** It is the possible range of movement in a joint or a series of joints. Increase in flexibility assists the performance of the highest range of movement with the least internal resistance. Therefore, flexibility has a mild influence on speed. It also helps to maximise the implementation of explosive strength.

2. Mention any three physiological factors determining endurance.

Ans. The three physiological determinants of endurance are:

- **Lactic acid tolerance:** This is an efficient predictor of endurance capacity. It is the ability to tolerate accumulation of lactic acid, especially during activities spanning 40 seconds or more. This accumulation is due to imbalance in formation and removal of lactic acid in the body. Endurance can be improved by enhancing lactic acid tolerance with proper training.
- **Movement economy:** Saving energy is always advantageous in endurance sports, to maintain the level of performance throughout the whole activity. Economical movements minimise energy consumption. This enables one to make precise movements and reduce unnecessary movements.
- **Muscle composition:** Muscles have two types of fibres, namely, fast-twitch and slow twitch fibres. Slow-twitch fibres exert a small

force and maintain it for a long time. That is why, higher percentage of slow-twitch fibres is ideal for endurance activities. However, this percentage is determined by genetic factors.

3. Explain any two physiological factors help in determining endurance. **(CBSE 2022)**

Ans. See answer 2 above

4. Differentiate between oxygen intake and oxygen uptake.

Ans. Oxygen intake refers to the process of breathing in oxygen from the air into the lungs. It is the amount of oxygen that is inhaled into the body during the breathing process. Oxygen intake is affected by several factors, including the rate and depth of breathing, the concentration of oxygen in the air, and the presence of any respiratory disorders.

On the other hand, oxygen uptake refers to the process of oxygen being absorbed by the body's tissues, including the muscles and organs, to be used in cellular respiration. Oxygen uptake is affected by various factors, including the level of physical activity, the health and efficiency of the cardiovascular and respiratory systems, and the availability of oxygen in the blood. In summary, oxygen intake is the amount of oxygen inhaled into the body, while oxygen uptake is the amount of oxygen absorbed by the body's tissues for use in cellular respiration.

5. Write any three effects of exercise on Cardio-respiratory system.

Ans. By doing exercise regularly for a long time the cardiovascular-respiratory system undergoes a certain process of adaptations known as long-term effects of exercise. These are listed below:

- Increase in the size of heart
- Decrease in resting heart rate
- Stroke volume increases at rest

6. List down any four effects of exercise on muscular system. **(CBSE SP 2022)**

Ans. Regular exercise has several beneficial effects on the muscular system. Here are four of them:

i. **Increased muscle strength:** Exercise causes the muscles to work harder than usual, which results in increased strength and endurance. This is due to the fact that regular exercise promotes the growth of new muscle fibres and increases the size of existing ones.

ii. **Improved muscle flexibility:** Exercise helps to improve muscle flexibility, which refers to the range of motion of a joint. Stretching exercises, in particular, help to improve flexibility and prevent injury by making the muscles more pliable.

iii. **Enhanced muscle endurance:** Exercise improves muscle endurance, which is the ability of the muscles to continue working over an extended period of time. Endurance exercises such as jogging, cycling, and swimming help to develop the cardiovascular system, which in turn increases the oxygen supply to the muscles.

iv. **Reduced muscle loss:** Regular exercise can help to reduce muscle loss, which is a common problem that occurs with age. Exercise promotes the production of hormones that stimulate muscle growth, which helps to preserve muscle mass and prevent atrophy.

7. Explain any two types of soft tissue injuries with help of examples. **(CBSE SP 2022)**

Ans. Soft tissue injuries, such as strains and sprains, are injuries to the body's connective tissues. A strain is a stretch or tear in a muscle or tendon, while a sprain is a stretch or tear in a ligament. Examples of strains include hamstring strains and rotator cuff strains, while examples of sprains include ankle sprains and wrist sprains. These injuries can be caused by overuse, repetitive motion, or sudden trauma.

8. Differentiate between strain and sprain.

Ans. A strain is a stretch or tear in a muscle or tendon, while a sprain is a stretch or tear in a ligament. Muscles and tendons connect muscles to bones, while ligaments connect bones to other bones. Strains are typically caused by overuse, repetitive motion, or sudden trauma, while sprains are often caused by sudden twisting or stretching of a joint. Both strains and sprains can range from mild to severe and can cause pain, swelling, and limited mobility.

9. Mention any three different types of bone injuries.

Ans. Refer to page 133 of the book.

10. Write any three different types of joint injuries.

Ans. Refer to pages 133-134 of the book.

11. What is Laceration and how can it be managed? **(CBSE SP 2021 Term 2)**

Ans. Laceration is the tearing of skin which results in an irregular cut. It is caused due to injury with a sharp sports equipment. It can be managed in the following manner:

- The first and foremost step is to stop the bleeding by applying pressure on the laceration and holding it above the heart level for 15 minutes. Pressure points also may be used if bleeding persists.
- After the bleeding stops, wash the area with lukewarm water and mild soap or antibacterial cleansers. Repeat the first step if it bleeds again.
- In minor cases, stitches are not required and the wound can be treated by applying an antibiotic ointment and covering it up with a bandage.

D. Short Answer Type-II Questions

1. How does the higher concentration of testosterone set males apart from females? Give two examples.

Ans. Males have a higher concentration of androgens such as testosterone, while females have a concentration of oestrogens. Therefore, the greater amount of testosterone gives males their deeper voice. Higher levels of testosterone helps in producing more RBCs.

2. Explain any three components of physical fitness. **(CBSE 2012)**

Ans. The three factors or components which determine physical fitness are as under:

- **Size of the muscle:** Size is an important determinant of strength. Larger muscles can exert greater amount of force than smaller ones. It has been noted that while the same amount of force is produced by the male and female muscles of the same type, males are stronger because their muscles are larger, and thus more powerful. Weight training increases the size of muscles and is used as an effective method of strength training.
- **Intensity of nerve impulse:** Muscles have several motor units. These units contract whenever a nerve impulse from the central nervous system stimulates them. Intense nerve impulse stimulates more number of motor units, which raises the strength of the muscular contraction. Hence, impulse also determines strength.
- **Muscle composition:** Muscles are composed of two types of fibres, fast twitch fibres and which can contract swiftly and produce more force, and slow-twitch fibres, which contract at a slower speed but which can sustain the contraction for a longer duration of time. Muscles with higher percentage of fast-twitch fibres are superior in strength. Therefore, strength is also determined by muscle composition. However, genetics determine the proportion of fast-twitch fibres and slow-twitch fibres in the muscles and training cannot alter it.

3. Briefly discuss at least three physiological factors that determine strength.

Ans. The three physiological factors that determine the strength are:

- **Size of the muscle:** Size is an important determinant of strength. Larger muscles can exert greater amount of force than smaller ones. It has been noted that while the same amount of force is produced by the male and female muscles of the same type, males are stronger because their muscles are larger, and thus more powerful. Weight training increases the size of muscles and is used as an effective method of strength training.
- **Point of tendon insertion:** Muscles strength can also vary with difference in the point of tendon insertion.
- **Body weight:** We often see that participants in the heavyweight category lift greater weight than those in the lightweight category. Therefore, heavier persons are stronger than those who are lighter.

4. Discuss at least three physiological determinants of speed.

Ans. The three physiological determinants of speed are:

- **Mobility of the nervous system:** The nervous system excites and inhibits the motor centres associated with contraction and relaxation of the related muscles at the highest possible speed. This process is called mobility of the nervous system. After the limited few seconds during which the nervous system enables these excitations and inhibitions, tension spreads all over the body due to the activity. Consequently, the speed decreases. This mobility is greatly affected by genetics and can be trained only to a certain degree.
- **Muscle composition:** Muscles with higher percentage of fast-twitch fibres contract with greater speed than those with a low percentage. Genetics determine their percentage and so it cannot be altered by any amount of training. Also, fast-twitch fibres

exist in varying quantities in different types of muscles. That is why, different parts of the body react with different speeds.

- **Flexibility:** It is the possible range of movement in a joint or a series of joints. Increase in flexibility assists the performance of the highest range of movement with the least internal resistance. Therefore, flexibility has a mild influence on speed. It also helps to maximise the implementation of explosive strength.

5. Discuss at least three physiological determinants of flexibility.

Ans. The three physiological determinants of flexibility are:

- **Extensibility of muscles:** Different ranges of movements are aided by muscles, their extensibility is another factor limiting flexibility. Muscles contract to make movements at the joints. Without proper and consistent stretching, muscles become stiff and lose their extensibility, and therefore, cause reduced flexibility. It can be trained to a certain degree to improve flexibility.
- **Previous injury:** Flexibility is adversely affected by injuries to connective tissues and muscles. Deposition of excess fibrous tissue takes place in the affected area, making them thick and resistant. These tissues are less elastic and cause limb shortening. As a result flexibility is decreased.
- **Age and gender:** Flexibility naturally decreases with age. It is partly due to degradation of the fibrous connective tissues that support, surround and bind muscle fibres, decrease in cartilage and the lubricant synovial fluid. Because of longer and more elastic muscles, women are more flexible than men.

6. Write about physiological factors determining endurance. **(CBSE 2019)**

Ans. The three physiological determinants of endurance are:

- **Lactic acid tolerance:** This is an efficient predictor of endurance capacity. It is the ability to tolerate accumulation of lactic acid, especially during activities spanning 40 seconds or more. This accumulation is due to imbalance in formation and removal of lactic acid in the body. Endurance can be improved by enhancing lactic acid tolerance with proper training.
- **Movement economy:** Saving energy is always advantageous in endurance sports, to maintain the level of performance throughout the whole activity. Economical movements minimise energy consumption. This enables one to make precise movements and reduce unnecessary movements.
- **Muscle composition:** Muscles have two types of fibres, namely, fast-twitch and slow twitch fibres. Slow-twitch fibres exert a small force and maintain it for a long time. That is why, higher percentage of slow-twitch fibres is ideal for endurance activities. However, this percentage is determined by genetic factors.

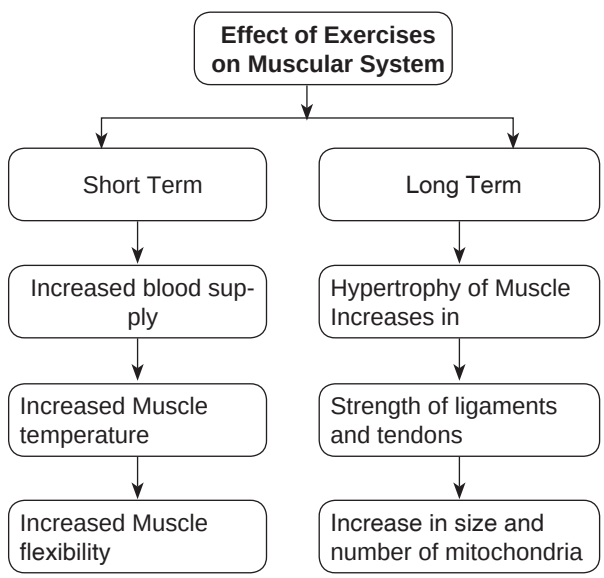
7. Briefly explain the effects of exercise on cardio-respiratory system.

Ans. By doing exercise regularly for a long time the cardio-respiratory system undergoes a certain process of adaptations known as long-term effects of exercise. These are listed below:

- Increase in the size of heart
- Decrease in resting heart rate
- Stroke volume increases at rest
- Increased blood flow
- Decrease in blood pressure
- Increase in blood volume
- Quick recovery rate
- Reduced risk of heart diseases.

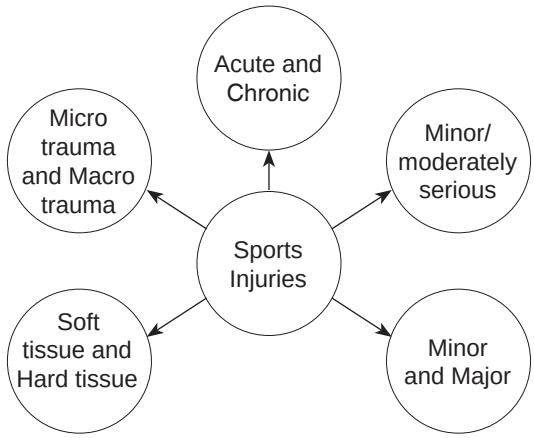
8. Create a mind map including six effects of exercise on muscular system.

Ans. Mind Map:



9. Create a flowchart to explain classification of sports injuries. **(CBSE SP 2021 Term 2)**

Ans. Flow Chart:



10. Make a table explaining any three types of sports injuries including their classification, causes, prevention and treatment.

Ans. Here is a table explaining three types of sports injuries, their classification, causes, prevention and treatment:

Type of Injury	Classification	Causes	Prevention	Treatment
Sprain	Soft Tissue Injury	Sudden twisting or stretching of a joint	Proper warm-up, wearing appropriate footwear, maintaining good flexibility and strength	Rest, ice, compression, elevation, physical therapy, surgery (in severe cases)
Strain	Soft Tissue Injury	Overuse, repetitive motion, or sudden trauma to a muscle or tendon	Proper warm-up, stretching, gradually increasing intensity and duration of activity, using proper technique	Rest, ice, compression, elevation, physical therapy, surgery (in severe cases)
Abrasion	Skin Injury	Friction or scraping against a rough surface	Wearing protective clothing, using proper equipment, maintaining playing surfaces	Cleaning the wound, applying an antiseptic, covering with a sterile bandage

11. Define the five types of soft tissue injuries.

Ans. Contusion, strain, sprain, abrasion, laceration, incision, hematoma are the types of soft tissue injury.

Contusion is a muscle injury caused by a blow to the skin, such as getting hit or bumping against something which leads to ruptured blood vessels. The affected area becomes red, then blue and then purple.

Laceration is the tearing of skin which results in an irregular cut. It is caused of injury with a sharp sports equipment. Incision is a smoothly–cut skin wound made by a sharp sport equipment , spike, etc.

Abrasion is a superficial injury to the skin when something rubs against it. It does not penetrate deeper than the epidermal layer of the skin. Friction between skin and hard or rough surface leads to abrasion.

Strains are caused by excessive use or forced stretching of the muscles or tendons. There may be complete tearing of muscles or tendons. Strains are common in contact sports such as boxing, football, hockey, wrestling, etc.

Sprain is the result of injury to the ligaments because of overstretching or tearing. The extent of injury and the number of injured ligaments determine the severity of the sprain. Ligaments in knees, ankles, and wrists are more susceptible to sprain. Sprain may be due to falling, twisting or getting hit during training and competitions.

12. Draw diagram and explain the management of any two types of bone injury. **(CBSE 2022)**

Ans. Refer to page 133 of the book

13. Define any three types of fractures.

Ans. Bone injuries are fractures caused by forces or pressures greater than the strength of the osseous tissue. The different types of bone

injuries are:

(i) Simple fracture

(ii) Compound fracture

(iii) Complicated fracture

(iv) Stress fracture

(v) Green stick fracture

(vi) Comminuted fracture

(vii) Impacted fracture

(viii) Transverse fracture

(ix) Oblique fracture

- **Simple Fracture:** A broken bone in a single part of the body in the absence of of a wound is called simple fracture.
- **Compound fracture:** In this type of fracture the skin and muscles are damaged and the bone usually protrudes out of the torn skin.
- **Green stick fracture:** Bending of bones or a slight crack is called green stick fracture. Children are more vulnerable to this type of fracture due to underdeveloped bones.

14. Define the types of dislocation.

Ans. The types of dislocation are:

- **Dislocation of the jaw:** This injury impacts one or both of the joints connecting the lower jaw to the skull. These joints, also called the temporomandibular joint (TMJ) may break, crack or even become entirely separated from the skull. It may be caused when the chin forcefully strikes another object, or when the face is hit by a strong external force.
- **Dislocation of shoulder joint:** In this type of dislocation, the ball of the humerus comes out of the socket. This may be caused by extreme rotation of the shoulder joint, or when the joint is hit by a sudden blow or is impacted by a fall against a hard surface.
- **Dislocation of hip joint:** A hip dislocation occurs when the head of the thigh bone (femur) is forced out of its socket in the hip bone (pelvis). This happens only in cases where the body comes into contact with a powerful force, such as falling from a significant height onto a hard surface.
- **Dislocation of the wrist:** It is dislocation of any of the eight carpal bones making up the wrist. This may happen when the carpal bones, which are small bones, are hit or come into contact with another force which is too great.

15. Describe four causes of sports injuries.

Ans. The four causes of sports injuries are:

- **Poor training methods and duration:** One of the leading causes of injury is poor training. Unhealthy methods, long period of training sessions without rest lead to injuries during training and competitions. Undertraining is as harmful as overtraining.
- **Lack of preparation:** If players do not prepare themselves properly, they are liable to get injured. They are not conditioned to face the challenges and to use the right techniques while performing. Therefore, they get easily hurt if both their body and mind are not prepared well in advance.
- **Improper warming-up:** Without a proper warming-up routine, players are likely to injure themselves because their bodies are less flexible in the beginning after a period of inactivity. So, warming-up is absolutely necessary before a training session and competitions.
- **Lack of good sports facilities:** Insufficient and poor sports facilities increase the risk of injuries among players. Hazardous sports environment leads to many injuries such as abrasion, sprain, fractures and so on.

16. Give five tips for preventing sports injuries.

Ans. The five tips for preventing sports injuries are as follows:

- Do not train if you are feeling fatigued.
- During heavy training, include more carbohydrates in your diet.
- The more you train, the more you should rest.
- Stop any exercise or activity if you feel pain.
- Take proper time for warming-up and cooling down.

17. How can abrasion be treated?

Ans. Abrasion:

- The first step is to wash the injured area with cold water, followed by application of an antiseptic.
- In case of a serious abrasion light dressing should be done to speed-up the process of recovery.
- Anti-tetanus injection should be given. Painkillers may also be given if patient experiences severe pain.

18. How can sprain be treated?

Ans. Sprain:

- First the injured part should be kept in a comfortable and elevated position and cold compression applied for 10 to 20 minutes. This should be repeated 6 to 8 times a day.
- Warm water can be applied after 2 or 3 days at least 3 to 4 times a day, and a light massage given to the affected area.
- If it is ankle sprain then a bandage should be tightly applied in the shape of the figure '8'.

19. How are contusions treated?

Ans. Contusions:

- The first step is to apply cold compression on the injured area for a duration of not less than 40 minutes. This should be repeated 5 to 6 times daily.
- Anti-inflammatory medicine should be given in case of swelling. If swelling persists expert medical help should be sought.
- Flexibility exercises will help during rehabilitation.

20. How are lacerations treated?

Ans. Lacerations:

- The first and foremost step is to stop the bleeding by applying pressure on the laceration and holding it above the heart level for 15 minutes. Pressure points also may be used if bleeding persists.
- After the bleeding stops, wash the area with lukewarm water and mild soap or antibacterial cleansers. Repeat step 1 if it bleeds again.
- In minor cases, stitches are not required and it can be treated by applying an antibiotic ointment and covering it up with a bandage.
- In deep laceration, stitches are necessary to close the wound and join the torn skin, muscle, and tissue, again.
- A surgical drape or sterile gauze should be placed over the wound and taped.
- Change the dressing regularly and clean the wound each time.
- Give antibiotic medicines and painkillers if prescribed by the doctor.

21. How are incisions treated?

Ans. Incisions:

- If the wound is shallow, let the blood come out because this removes germs from the wound as well.
- Clean the wound and surrounding areas with iodine tincture or spirit.
- Place a piece of cotton on the area and wrap it with a bandage to keep away dirt and germs.
- Keep the bandage tight if there is excessive bleeding.
- Get medical help immediately.

22. How are strains treated?

Ans. Treatment of strain should be done using the PRICE method. It is important to take precautions to avoid heat during the first 72 hours after the injury, such as hot baths, sauna baths or heat packs, etc. Running or exercising should be avoided

23. Explain PRICE procedure as a treatment for soft tissue injury. **(CBSE 2020)**

Ans. For PRICE procedure as a treatment of soft tissues injuries, refer to page 138 of the textbook.

24. How can dislocation be treated?

Ans. Initial care and treatment for any dislocation involves PRICE (Protection Rest, Ice, Compression and Elevation). After this treatment, sometimes the dislocated joint might naturally go back into place. The application of ice immediately after injury to the injured area checks internal haemorrhage aiding in keeping the clot organization as small as possible. This helps in fast repair and healing.

E. Long Answer Type Questions

1. Explain any four physiological factors determining strength. What are the effects of regular exercise on the muscular system? **(CBSE 2020)**

Ans. Refer to page 124 and page 128 of the book

2. Explain the physiological factors determining speed. **(CBSE 2017)**

Ans. The physiological factors determining speed are:

- Mobility of the nervous system
- Muscle composition
- Explosive strength
- Flexibility
- Biochemical reserves and metabolism.

(For brief explanation, refer page 133 of the textbook.)

3. Discuss in detail two long term and two short term effects of exercise on cardio-respiratory system. **(CBSE 2022)**

Ans. The cardio-respiratory system is responsible for supplying oxygen to the body and removing carbon dioxide. Regular exercise has both short-term and long-term effects on this system. Here are two of each:

Short-term effects:

- **Increased heart rate:** During exercise, the heart rate increases to pump more blood and oxygen to the muscles. This increases the heart's efficiency and allows it to pump more blood with fewer beats.
- **Increased breathing rate:** Exercise increases the breathing rate to deliver more oxygen to the body and remove carbon dioxide. This helps to improve lung function and increase the amount of oxygen that is available to the muscles.

Long-term effects:

- **Improved cardiovascular health:** Regular exercise helps to improve the health of the cardiovascular system by strengthening the heart and blood vessels. This can reduce the risk of heart disease, stroke, and other cardiovascular conditions.
- **Increased aerobic capacity:** Aerobic capacity refers to the body's ability to use oxygen to produce energy. Regular exercise can increase the body's aerobic capacity by improving the function of the heart, lungs, and muscles. This allows the body to perform physical activities with less effort and fatigue.

Overall, regular exercise is beneficial for the cardio-respiratory system, both in the short and long term. It can help to improve heart and lung function, increase oxygen delivery to the muscles, and reduce the risk of cardiovascular diseases.

4. What is the effect of exercise on cardiorespiratory and muscular system? **(CBSE 2020)**

Ans. The effects of exercise on the cardiorespiratory system are as follows:

- Increase in heart rate;
- Increase in stroke volume;
- Increase in cardiac output;
- Increase in blood flow;
- Increase in blood pressure.

(For brief description of each point, refer pages 129–130 of the textbook.)

The effects of exercise on the muscular system are that it:

- Changes in anatomy of the muscles;
- Increases in number of capillaries;
- Improves the strength of connective tissues;
- Improves the efficiency;
- Delaying fatigue;
- Activation of the non-functioning fibres;
- Correct body posture;
- Improvement of reaction time.

(For brief explanation, refer page 128-129 of the textbook.)

5. What is endurance? Explain the various methods for its development.

(CBSE 2014, 2020, 2022)

Ans. Endurance is the ability to resist fatigue and sustain an activity for a long duration of time. It is determined by the physiological factors like aerobic capacity which means oxygen intake, oxygen transport, oxygen uptake, energy reserves, and secondly lactic acid tolerance, thirdly movement economy and finally muscle composition.

(Refer pages 126-127 of the textbook.)

6. Discuss the types of soft tissue injuries in detail.

Ans. **Soft tissue injuries include:**

- **Contusion:** it is a muscle injury caused by a blow to the skin, such as getting hit or bumping against something, which leads to ruptured blood vessel. Such an injury can occur with or without the involvement of sports equipment.
- **Strain:** Strains are caused by excessive use or forced stretching of the muscles or tendons. They can be minor or severe depending on the nature of the injury. Strains are also known as 'torn muscle', 'muscle pull' and 'ruptured tendon'. These can be classified as:

  – Acute strain/Overstress and

  – Chronic strain/Overuse.

  It can be of varying degrees like:

  – First degree,

  – Second degree and

  – Third degree.
- **Sprain:** It is the result of injury to the ligaments because of overstretching or tearing. The extent of injury and the number of injured ligaments determine the severity of the sprain. It can due to falling, twisting or getting

hit during training and competitions. It can be accompanied by a fracture causing swelling, inflammation, severe pain and tenderness in the affected area.

- **Abrasion:** It is a superficial injury to the skin when something rubs against it. It can be of various degrees like First degree, Second degree and finally of Third degree.
- **Laceration:** It is the tearing of skin which results in an irregular cut. It is caused by injury with a sharp sports equipment. Lacerations are generally seen in skating, basketball, fencing, etc.
- **Incision:** It is a smoothly-cut skin wound made by a sharp sport equipment, spikes, etc. In this type of cut, usually blood comes out freely.
- **Hematoma:** It is caused due to internal tissue rupture where there is a large collection of blood. It is also known or internal blood clotting.

7. Contusion and dislocation are common sports injuries. Write in detail about the symptoms and management of these injuries. **(CBSE 2019)**

Ans. **Contusion:** it is a muscle injury caused by a blow to the skin, such as getting hit or bumping against something, which leads to ruptured blood vessel. Such an injury can occur with or without the involvement of sports equipment.

Management of Contusion:

- The first step is to apply cold compression on the injured area for a duration of not less than 40 minutes. This should be repeated 5 to 6 times daily.
- Anti-inflammatory medicine should be given in case of swelling. If swelling persists expert medical help should be sought.
- Flexibility exercises will help during rehabilitation.

Dislocation: Dislocation of joints is mainly caused by sudden trauma causing the joint to go beyond its limits. Forceful impact between the body and another player or equipment, a hard surface may cause dislocation of joints and associated bones. Dislocation can occur at any major joint like shoulders, knees, or minor joint like toes, fingers, etc.

Management of Dislocation: In bone injuries, initial care and treatment for dislocation involves RICE (Rest, Ice, Compression and Elevation). After this treatment, sometimes, the dislocated joint might naturally go back into place. The application of ice immediately after injury to the injured area checks internal haemorrhage aiding in keeping the clot organization as small as possible. This helps in fast repair and healing. For small joints, compression and cold must be maintained for at least an hour and for larger joints up to 24 hours. Depending on the extent of injury, fixation and support should be for a duration of 2 days to 3 weeks. Massage should be avoided for 2 days to ensure proper haemorrhage control. While taking the patient to the physician for evaluation, the injury should be properly splinted and supported to prevent any further damage to the area.

8. Classify sports injuries. Explain PRICE procedure as a treatment of soft tissue injuries.

(CBSE 2017)

Ans. Sports injuries can be classified into the following depending upon their cause and locations.

Depending on their causes:

- Direct injury is an injury incurred where the body makes contact with an external force.
- Indirect injury is an injury caused by force inside the body like excess strain on muscles and ligaments.
- An overuse injury occurs when specific parts of our body are used over a period of time, especially when the movements are repetitive.

Depending upon the location:

- Soft tissue includes all muscles, ligaments, tendons, skin, organs, etc.
- Bone injuries are fractures caused by forces or pressure greater than the strength of the osseous tissue.
- Joint Injuries to any point in the body is joint injury and dislocation is one of the most common joint injuries.

(For PRICE procedure as a treatment of soft tissues injuries, refer to page 138 of the textbook).

9. What do you understand by fracture? How can fracture be classified? Explain. **(CBSE 2019)**

Ans. Bone injuries are fractures caused by forces or pressures greater than the strength of the osseous tissue. The different types of bone injuries are:

- Simple fracture: A broken bone in a single part of the body in the absence of a wound is called simple fracture.

- Compound fracture: This type of fracture is accompanied by damage to the muscles and skin and the bone usually protrudes out of the torn skin.
- Complicated fracture: Along with the bones, other parts of the body also get damaged in a complicated fracture. It is a serious and dangerous type of injury.
- Green stick fracture: Bending of bones or a slight crack called green stick fracture.
- Comminuted fracture: It is a type of fracture in which bones break into or more pieces.
- Impacted fracture: In this type of fracture, shattered or fragmented pieces of a broken bone enters into another bone under the influence of an impact.

10. Make a table on the types of fractures and their treatment.

Ans. Here is a table on different types of fractures and their treatment options:

Type of Fracture	Description	Treatment
Simple fracture	The bone is broken but does not break through the skin	Immobilisation with a cast, splint, or brace, pain medication, physical therapy
Compound fracture	The broken bone protrudes through the skin, increasing the risk of infection	Emergency care to prevent infection, surgery to clean the wound and stabilise the bone, immobilisation with a cast, splint, or brace, pain medication, physical therapy
Complicated fracture	The broken bone damages surrounding tissues, such as nerves and blood vessels	Emergency care to prevent further damage, surgery to repair the bone and surrounding tissues, immobilisation with a cast, splint, or brace, pain medication, physical therapy
Stress fracture	A small crack in the bone caused by overuse or repetitive motion	Rest, immobilisation with a cast, splint, or brace, pain medication, physical therapy
Greenstick fracture	The bone is bent but not completely broken, most common in children	Immobilisation with a cast, splint, or brace, pain medication, physical therapy
Comminuted fracture	The bone is broken into multiple pieces	Surgery to realign and stabilise the bone, immobilisation with a cast, splint, or brace, pain medication, physical therapy
Impacted fracture	The broken ends of the bone are driven into each other	Immobilisation with a cast, splint, or brace, pain medication, physical therapy
Transverse fracture	The break is straight across the bone	Immobilisation with a cast, splint, or brace, pain medication, physical therapy
Oblique fracture	The break is at an angle to the bone	Immobilisation with a cast, splint, or brace, pain medication, physical therapy

11. Write in detail about the dislocation and fractures among the bones and joint injuries. **(CBSE 2016)**

Ans.
- **Dislocation of the jaw:** This injury impacts one or both of the joints connecting the lower jaw to the skull. It may be caused when the chin forcefully strikes another object, or when the face is hit by a strong external force.
- **Dislocation of shoulder joint:** In this type of dislocation, the ball of the humerus comes out of the socket. This may be caused by extreme rotation of the shoulder joint or when the joint is hit by a sudden blow or is impacted by a fall against a hard surface.
- **Dislocation of hip joint:** A hip dislocation occurs when the head of the high bone is forced out of its socket in the hip bone.
- **Dislocation of the wrist:** It is dislocation of any of the eight carpal bones making up the wrist. This may happen when the carpal bones, which are small bones, are hit or come into contact with another force which is too great.

12. Describe in detail the causes of sports injuries.

Ans. The causes of sports injuries are:
- Poor training methods and duration
- Lack of preparation
- Improper warming-up
- Lack of scientific knowledge
- Lack of fitness
- Nutritional deficiency
- Lack of good sports facilities
- Injudicious officiating
- Improper warming up
- Lack of scientific knowledge
- Lack of fitness
- Nutritional deficiency
- Lack of good sports facilities

- Injudicious officiating
- No use of protective equipment
- Lack of proper rest
- Pressure of competition
- Carelessness during sporting activities
- Recurrence of injury and overuse of muscles

(For detailed description of each point, refer to pages 134–135 of the textbook.)

13. What are the preventive measures that can be taken in case of sports injuries? **(CBSE 2013)**

Ans. One can take the following preventive measures in sports injuries:

- Proper warming-up
- Proper conditioning and preparation
- Balanced diet
- Proper knowledge of sports skills
- Use of protective equipment
- Proper sports facilities
- Impartial/Unbiased officiating
- Avoiding overtraining
- Use of proper technique
- Obeying the rules
- Proper cooling down

(For detailed description of above points, refer pages 136–137 of the textbook.)

14. Write a detailed note on the treatment of soft tissue injuries.

Ans. **Treatment of soft tissue injuries:**

The soft tissue injuries include like managements of abrasion, contusion, laceration, incision, sprain, and strain.

Abrasion: Firstly rinse and cleaned the area with cool or lukewarm freshwater and antibacterial cleaners. Gently, remove dead tissues, dirt or debris with sterile gauze. The further process of holding under the running water, drying and dressing it.

Contusion: Cold compression is applied on the affected area, if swelling is more than usual, anti-inflammatory medicines are given and the rehabilitation process is done with light flexibility.

Laceration: It is the first and foremost duty to stop the bleeding by applying pressure tactics holding it above the heart level, to wash the bleeding when it stops.

Incision: Let the blood come out if the wound is shallow, clean the wound and surrounding areas, place a piece of cotton on the wounded area and wrap it with a bandage, keep the bandage tight and get medical help immediately if the incision is too deep.

Sprain: PRICE which includes Protection, Rest, Ice, Compression Elevation is crucial in every injury, and the MICE method which includes Mobilisation, Ice, Compression, Elevation, etc. be applied for soft tissue injuries as per their locations.

Strain: It should be managed by doing the PRICE method.

15. How are bone injuries treated?

Ans. In bone injuries, initial care and treatment for dislocation involves RICE (Rest, Ice, Compression and Elevation). After this treatment, sometimes, the dislocated joint might naturally go back into place. The application of ice immediately after injury to the injured area checks internal haemorrhage aiding in keeping the clot organization as small as possible. This helps in fast repair and healing. For small joints, compression and cold must be maintained for at least an hour and for larger joints up to 24 hours. Depending on the extent of injury, fixation and support should be for a duration of 2 days to 3 weeks. Massage should be avoided for 2 days to ensure proper haemorrhage control. While taking the patient to the physician for evaluation, the injury should be properly splinted and supported to prevent any further damage to the area.

16. Sprains and strains are most common sports injuries. Write in detail about these soft tissue injuries and their treatment.

Ans. **Sprain:**

- **PRICE:** Stands for Protection, Rest, Ice, Compression and Elevation.
  - **Protection:** The injured area should be protected from further damage immediately using splint and supporting or protecting the feet with shoes or lace-ups.
  - **Rest:** One should avoid the practice of moving the injured part constantly and should not start doing exercise or other activities before the injury is completely healed.
  - **Ice:** Apply ice as early as possible. Packed in plastic bags or a clean cloth on the injury for 15–20 minutes. It reduces bleeding,

swelling and pain by decreasing blood circulations.

- **Compression:** Wrap the injury starting from the furthest injured part to the main injured part by using an elastic bandage or compression strap.
- **Elevation:** Elevate the injured part to reduce the swelling by using pillows above the heart level. These are based on the cause.

- **MICE** After the symptoms of inflammation subside, the procedure of MICE should be followed until the injury is healed.
  - **Mobilisation:** It should be started with moderate and light exercises to restore the normal range of movement of the injured part and avoid wasting of muscles.
  - **Ice:** Ice application should be continued for about a week depending on the severity of the injury. Heat treatment may be applied for increasing blood circulation.
  - **Compression:** It should be continued for a few days on the nature of injury.
  - **Elevation:** This should be continued until swelling and inflammation subside.

Strain: Management of strain should be done using the PRICE method. It is important to take precautions to avoid heat during the first 72 hours after the injury, such as hot baths, sauna baths or heat packs, etc. Running and exercising should be avoided as well during this period. In severe cases, physiotherapy should be included to restore muscular strength and range of movement to their normal state.

F. Value-Based Question

A famous cricket star Phillip Hughes was struck behind the ear by a ball while batting and died two days after the injury. He was wearing a helmet but the possible reason mentioned was that even when using a helmet, possibly a significant part of the neck remained exposed and the ball hit him there. And now most of the top cricketers across the world use deeper protection.

Answer the following questions based on the above passage:

1. Do you feel protective gears are important? Lay stress on your views.
2. What first aid should be provided during injury at the superficial layer of the skin?

(CBSE 2017)

Ans. **1.** Yes, the protective gears are very important for the reason that it might injure any of the body part most significantly the head, face jaws neck. Therefore, one needs to have protective measures to be on the safer side.

2. The first aid should be provided during injury at the superficial layer of the skin.

CHAPTER 8

BIOMECHANICS AND SPORTS

P. 157–162

A. Objective Type/Multiple-Choice Questions

I. Multiple-Choice Questions:

1. Who gave laws of motion? **(CBSE SP 2021 Term 1)**

(a) Galileo (b) Pascal

(c) Newton (d) Darwin

Ans. (c) Newton

2. In cricket, the greater the force exerted by the bat on the ball, the higher is the speed with which the ball moves towards the boundary. This is an application of which law of motion given by Newton?

(a) First law (b) Second law

(c) Third law (d) None of these

Ans. (b) Second law

3. Newton's first law of motion is also known as **(CBSE 2020, CBSE SP 2021 Term 1)**

(a) Law of inertia

(b) Law of action and reaction

(c) Law of acceleration

(d) Law of learning

Ans. (a) Law of inertia

4. The law of acceleration is also known as **(CBSE 2020)**

(a) Law of inertia

(b) Law of action and reaction

(c) Law of momentum

(d) Boyle's law

Ans. (c) Law of momentum

5. In Law of Acceleration, acceleration of an object is inversely proportionate to its ..... **(CBSE SP 2022)**

(a) force (b) mass

(c) speed (d) size

Ans. (a) force

6. In swimming, a swimmer gets propelled faster in the forward direction if she pushes the water faster in the backward direction. This is an application of which law of motion given by Newton?

(a) First law (b) Second law

(c) Third law (d) None of these

Ans. (c) Third law

7. Starting a throwing event in athletics is an example of which law of motion. **(CBSE SP 2021 Term 1)**

(a) First law of motion

(b) Second law of motion

(c) Third law of motion

(d) First and third law of motion

Ans. (a) First law of motion

8. Cartwheel in gymnastics is an example of ..... **(CBSE SP 2022)**

(a) static equilibrium (b) dynamic equilibrium

(c) active equilibrium (d) passive equilibrium

Ans. (b) dynamic equilibrium

9. What are the two sub-categories of equilibrium based on the position of centre of gravity?

(a) Static and dynamic

(b) Stable and potential

(c) Physical and mental

(d) Unstable and neutral

Ans. (a) Static and dynamic

10. The force which opposes the relative motion between the surfaces of two objects is known as **(CBSE 2020)**

(a) frictional force. (b) gravitational force.

(c) applied force. (d) mechanical force.

Ans. (a) frictional force

11. Which of these types of friction is stronger than the others given below?

(a) Rolling friction

(b) Sliding friction

(c) Static friction

(d) All are equally strong

Ans. (c) Static friction

12. What are the three types of dynamic friction?

(a) Sliding friction, Rolling friction and Fluid friction

(b) Rolling friction, Static friction and Solid friction

(c) Fluid friction, Solid friction and Passive friction

(d) Active friction, Fluid friction and Static friction

Ans. (a) Sliding friction, Rolling friction and Fluid friction.

13. Which of the following is known as a necessary evil?

(a) Inertia (b) Friction

(c) Counterforce (d) Acceleration

Ans. (b) Friction

14. Where do the frictional forces come from in skiing?

(a) Snow (b) Air

(c) Surface of ski (d) All of these

Ans. (d) All of these

15. Which of these measures is a way to decrease friction?

(a) Presence of spikes on the soles of

(b) Application of chalk powder on the football shoes hands and feet by gymnasts

(c) Use of rough tyres in racing bikes

(d) Use of narrow boats in rowing

Ans. (d) Use of narrow boats in rowing

16. The force of friction depends upon ..... **(CBSE 2020)**

(a) nature of surface of contact.

(b) material of objects in contact.

(c) both (a) and (b).

(d) none of these.

Ans. (c) both (a) and (b).

17. Which of the following is not an example of projectile?

(a) A missile launched into the air

(b) An arrow released from a bow

(c) A bullet fired from a gun

(d) A car running on the road

Ans. (a) A missile launched into the air

18. If an object is projected at ..... angle, it will come back to its original position from where it is being projected.

(a) 30° (b) 45°

(c) 60° (d) 90°

Ans. (d) 90°

II. Match the following:

List I – Sport	List II – Guiding laws
(i) Sprinting	(1) Sliding friction
(ii) Football	(2) Law of reaction
(iii) Swimming	(3) Law of inertia
(iv) Ice skating	(4) Law of acceleration

Select the correct set of options:

(a) (i)–(3), (ii)–(4), (iii)–(2), (iv)–(1)

(b) (i)–(2), (ii)–(1), (iii)–(3), (iv)–(4)

(c) (i)–(1), (ii)–(3), (iii)–(4), (iv)–(2)

(d) (i)–(3), (ii)–(2), (iii)–(1), (iv)–(4)

Ans. (a) (i)–(3), (ii)–(4), (iii)–(2), (iv)–(1)

III. Assertion-Reason Type Questions: CBQ

Given below are the two statements labelled Assertion (A) and Reason (R).

1. A: If an object A applies force FA to object B, then the object B also exerts an equal and opposite force FB to object A.

   R: For every action, there is always an equal and opposite reaction.

2. A: A change in the acceleration of an object is directly proportional to the force producing it and inversely proportional to its mass.

   R: Lighter mass will travel at a faster speed.

(CBSE SP 2021 Term 1)

In the context of the two statements given above, which one of the following is correct?

(a) Both (A) and (R) are true and (R) is the correct explanation of (A).

(b) Both (A) and (R) are true but (R) is not the correct explanation of (A).

(c) (A) is true, but (R) is false.

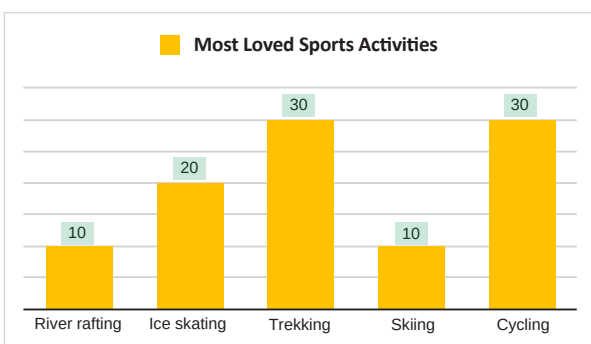
(d) (A) is false, but (R) is true.

Ans. 1. (a) Both (A) and (R) are true and (R) is the correct explanation of (A).

2. (b) Both (A) and (R) are true but (R) is not the correct explanation of (A).

IV. Data-Based Questions: CBQ

Most loved sports activities data was collected from three cities:



On the basis of the chart given above, answer the following questions:

1. What sort of friction will be experienced by the people who prefer rafting?

   (a) Static friction (b) Sliding friction

   (c) Rolling friction (d) Liquid friction

2. A group of trekkers or skiers standing on a hill will be experiencing which friction?

   (a) Static friction (b) Sliding friction

   (c) Rolling friction (d) Liquid friction

3. Which of the following activities' alternative form would make one experience rolling friction?

   (a) Trekking (b) Rafting

   (c) Skating (d) Skiing

Ans. 1. (d) Liquid friction; 2. (a) Static friction; 3. (c) Skating

V. Picture-Based Questions: CBQ

Identify the following types of frictions and name them:

1. 

   .....

2. 

   .....

3. 

   .....

4. 

   .....

Ans. **1.** Sliding Friction; **2.** Fluid Friction; **3.** Rolling Friction; **4.** Static Friction

VI. Case-Based Questions: CBQ

1. Rishi who was studying in class XII is a science stream student. During his Physical Education class, he got confused how Newton's laws of motion are useful in sports and how they can be applied in sports. But his teacher explained these laws with help of examples from sports which proved to be very helpful for him. Swimming is the best example of which law of motion? **(CBSE SP 2021 Term 1)**

   (a) Law of inertia (b) Law of acceleration

   (c) Law of reaction (d) Both (a) and (c)

Ans. (d) Both (a) and (c)

2. 'Balance' in sports is another word for 'stability'. The degree of stability is influenced by a number of factors such as:

   - Area of base support
   - Vertical distance of the COG from the centre of the base of support
   - Location of the COG
   - Horizontal distance of the COG from the direction of movement
   - Weight of the body
   - Friction

   On the basis of the information given above, answer the following questions:

   (a) Stability is directly proportional to ..... from the edge of the base towards the given direction of movement.

   (b) Why do different sports have different weight categories?

   (c) When there is insufficient friction between two bodies there is ..... chance of slipping and therefore

   (d) Give one example of COG in sports.

Ans. **(a)** to the area of the base

(b) As the stability is directly proportional to the weight of the body.

(c) greater

(d) In shot-put, the COG of the body is lowered by bending the knees so that the player can avoid going out of the circle and thus committing a foul.

3. The teachers as well as coaches always make their best efforts to improve the performance of their students in various competitive games and sports. They can help to improve the performance of students if they have adequate knowledge of biomechanics.

(CBSE SP 2022)

(a) The more force one exerts on the downward bounce, the higher the ball bounces into the air. Which law is this statement being referred to?

(b) Among the above given pictures, Newton's third law is depicted in .....

(c) Newton's second law is also known as .....

(d) The study of human body and various forces acting on it is .....

OR

A high jumper can jump higher off a solid surface because it opposes her/his body with as much force as she/he is able to generate. This example refers to which law of motion?

Ans. (a) Newton's third law of motion

(b) In both the pictures

(c) law of acceleration

(d) Biomechanics

OR

Law of action and reaction

B. Very Short Answer Type Questions

1. What is Newton's first law of motion?

Ans. Newton's first law of motion: "A body at rest will continue at its state of rest and a body in motion will remain in its state of uniform motion in the same direction, unless an external force acts on them."

2. State Newton's second law of motion.

Ans. Newton's second law of motion (Law of acceleration): "A change in acceleration of a body is directly proportional to the force acting on it and inversely proportional to the mass of the body."

3. What is Newton's third law of motion?

Ans. Newton's third law of motion (Law of reaction or Law of counter force): "For every action there is an equal and opposite reaction".

4. Define equilibrium.

Ans. Equilibrium is defined as a state of balance or a stable situation, where opposite forces cancel each other out and where no changes are occurring.

5. What is centre of gravity of an object?

Ans. The centre of gravity (COG) of an object is the point where the entire weight of the object can be considered to be concentrated. It is the point at which the object will balance if suspended from that point. In other words, it is the point where the force of gravity can be considered to act on the object.

6. Write any two factors on which stability of a body depends.

Ans. The stability of a body depends on two main factors: the position of the body's centre of gravity and the base of support of the body. The lower the centre of gravity and the wider the base of support, the more stable the body will be.

7. Define friction and name its types. **(CBSE 2017)**

Ans. Friction is defined as a force developing on the surface of contact of two bodies and which opposes their relative motion. Friction is of two types:

- Static friction
- Dynamic friction

8. What is dynamic friction? **(CBSE 2016)**

Ans. Dynamic friction is the opposing force acting on a body moving over the surface of another body.

9. What is projectile trajectory? **(CBSE 2016)**

Ans. A projectile trajectory is the path that a projectile, such as a bullet, rock, or ball, takes through the air after it is launched or thrown. The trajectory is influenced by the projectile's initial velocity, angle of launch, air resistance and the force of gravity.

10. To cover the maximum distance at what angle should an object be released? **(CBSE 2016)**

Ans. To cover the maximum distance, an object should be released at a 45-degree angle. At this angle, the horizontal and vertical components of the initial velocity are equal, and the projectile will spend the maximum amount of time in the air, covering the greatest distance before hitting the ground.

C. Short Answer Type–I Questions

1. State the Newton's first law of motion and its application to sports.

Ans. Newton's first law of motion states that an object at rest will remain at rest, and an object in motion will continue in motion with a constant velocity, unless acted upon by an external force.

In sports, this law can be seen in action when a player kicks a soccer ball. The ball will continue moving forward in a straight line with a constant speed unless acted upon by an external force, such as friction from the ground or a collision with another object.

2. State the Newton's second law of motion and its application to sports.

Ans. Newton's second law of motion states that the acceleration of an object is directly proportional to the net force acting on it and inversely proportional to its mass.

In cricket, this law can be seen when a bowler delivers a ball. The faster the bowler runs towards the crease (increased force), the greater the acceleration of the ball as it leaves the bowler's hand (increased acceleration) and travels towards the batsman. The mass of the ball also plays a role in determining its speed and trajectory.

3. State the Newton's third law of motion and its application to sports.

Ans. Newton's third law of motion states that for every action, there is an equal and opposite reaction.

In sports, this law can be seen in action when a football player kicks a ball. The player exerts a force on the ball in one direction, and the ball exerts an equal and opposite force on the player in the opposite direction. In other words, the player's foot pushes the ball forward, while the ball pushes back on the foot with an equal force in the opposite direction.

4. What are the different types of equilibrium based on the position of COG?

Ans. Refer to page 150 of the book.

5. Which factors affect the degree of stability?

Ans. Refer to pages 150-151 of the book.

6. What are the different types of equilibrium based on the degree of stability?

Ans. Refer to page 151 of the book.

7. Mention any three advantages of friction in sports.

Ans. Advantages of friction in sports are:

- A strong grip on rackets in badminton helps to deliver a perfect shot and prevents the racket from slipping.
- In basketball, friction between the shoes and the court helps players maintain control on their movement. For this reason, players often wipe their shoes.
- In cricket, players wear shoes with spikes which helps them in running around without the fear of slipping or falling.

8. Mention any three disadvantages of friction in sports.

Ans. Disadvantages of friction in sports are:

- In pole-vault, the athlete might lose grip of the pole due to less friction between palms and pole. So, they are advised to use adhesive on the palm to increase friction.
- As more friction means more energy so more force is required to overcome friction. So energy is wasted.
- Friction might lead to accidents also.

9. Why is a pole-vault athlete advised to use adhesive on the palm?

Ans. A pole-vault athlete is advised to use adhesive on the palm to improve their grip on the pole. The adhesive helps to increase the friction between the palm and the pole, allowing the athlete to maintain a better grip and prevent the pole from slipping out of their hand during the jump.

10. Mention any three factors affecting projectile motion.

Ans. Refer to pages 154-155 of the book.

11. What is projectile trajectory? **(CBSE 2016)**

Ans. A projectile trajectory is the path that a projectile, such as a bullet, rock, or ball, takes through the air after it is launched or thrown. The trajectory is influenced by the projectile's initial velocity, angle of launch, air resistance and the force of gravity.

12. An object thrown into the space either horizontally or at an acute angle under the gravity is called a projectile. Name the two forces which act on a projectile. **(CBSE 2017)**

Ans. The two forces that act on a projectile are gravity and air resistance (also known as drag). Gravity acts in the downward direction and causes the projectile to accelerate towards the ground, while air resistance acts in the opposite direction of motion and opposes the forward motion of the projectile.

D. Short Answer Type-II Questions

1. Make a table explaining the three Laws of Motion as proposed by Newton in relation to sports.

Ans. Here is the table:

Law of Motion	Explanation	Example in Sports
First Law (Law of Inertia)	An object at rest will remain at rest, and an object in motion will continue in motion with a constant velocity, unless acted upon by an external force.	A hockey puck will continue to slide on the ice until it is acted upon by friction or a player's stick.

Second Law (Law of Acceleration)	The acceleration of an object is directly proportional to the net force acting on it and inversely proportional to its mass.	A pitcher throws a fastball with greater force, resulting in a greater acceleration of the ball towards the batter.
Third Law (Law of Action-Reaction)	For every action, there is an equal and opposite reaction.	A diver pushes off a diving board, and the board pushes back on the diver with an equal and opposite force, propelling the diver into the air.

2. Write about the Newton's Laws of Motion and briefly discuss about their application in sports.

(CBSE 2019)

Ans. Newton proposed three laws of motion that help us in understanding the biomechanics involved in sports.

According to the first law of motion, a body at rest will continue in its state of rest and a body in motion will remain in its state of uniform motion in the same direction unless an external force acts on them. This law is used in the starting techniques of sports such as rowing, sprinting, hammer throw, etc. and landing in gymnastics.

According to the second law of motion, a change in acceleration of a body is directly proportional to the force acting on it and inversely proportional to the mass of the body. An example of batting in cricket will clear it. When a ball is hit, the change in speed depends on the force with which it has been hit, or in hammer throw, the physically stronger player will throw it harder than her/his opponents of lesser strength.

Similarly third law motion states that for every action, there is always an equal and opposite reaction. It means that if an object A applies force F_A to object B, then the object also exerts an equal and opposite force F_B to object A. For example, A is pushed forward by the reaction of a force equal and opposite in strength to its thrusts.

3. Give a detailed explanation about centre of gravity and its applications in sports.

Ans. The centre of gravity is the point within an object where the weight is evenly distributed in all directions. In sports, the concept of the centre of gravity is important because it affects an athlete's balance and stability. A lower centre of gravity provides greater stability, while a higher centre of gravity makes an athlete more top-heavy and less stable.

For example, in gymnastics, balance beam routines require the gymnast to maintain their centre of gravity over a narrow beam while performing complex acrobatic movements. In basketball, a player with a low centre of gravity may be better at maintaining their balance and driving to the basket while being defended.

Understanding the centre of gravity can also help coaches and trainers to design equipment, such as skis, snowboards and bikes, that are more stable and perform better in competitions.

4. How can the principles of stability be used in sports?

Ans. The principles of stability can be used in sports to improve an athlete's performance and reduce the risk of injury. Here are a few ways:

i. Lowering the centre of gravity: Athletes can improve their stability by lowering their centre of gravity, which increases their base of support and reduces the risk of falling over. This can be achieved through exercises that focus on balance and core strength.

ii. Increasing the base of support: Athletes can improve their stability by increasing their base of support, which can be achieved by widening their stance or using wider equipment, such as skis or snowboards.

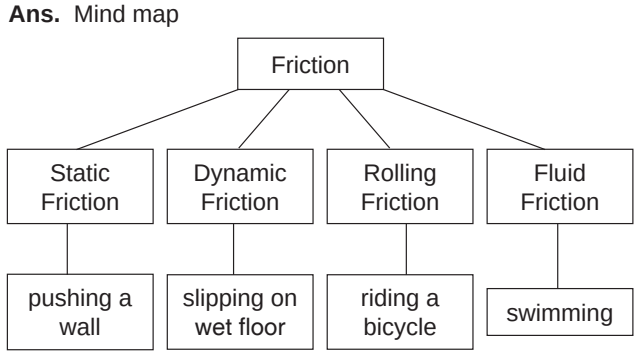
iii. Using proper technique: Proper technique can also improve an athlete's stability, as it allows them to maintain their centre of gravity over their base of support. This is particularly important in sports like gymnastics, diving and figure skating.

iv. Using equipment designed for stability: Equipment can also be designed to improve stability, such as shoes with better traction, helmets with improved shock absorption, or bicycles with wider tires and better suspension.

Overall, the principles of stability are important for athletes to perform at their best and reduce the risk of injury.

5. Create a mind map on the types of friction.

Ans. Mind map



6. What is the relationship between friction and sports?

Ans. Friction plays a large role in the field of games and sports. Without the help of friction, a player won't be able to give a better performance. In skiing, the frictional forces that come into play are friction from snow, air friction and friction from the surface of the ski. A perfect control of all the frictional forces acting is required for winning. In the game of soccer, frictional forces acting between the shoes and the ground allows the players to run. In the same way, the friction between the shoes and the ball allows them to take control of the ball.

7. 'Friction is a necessary evil'. Justify your answer with suitable examples from sports.

(CBSE SP 2015)

Ans. Friction is a necessary evil which means that it is essential in sports/games. Without friction one cannot perform better in the field of sports. For example,

- The use of spiked shoes by athletes.
- Football players use studs to have appropriate friction while they run fast.
- Lime on the palms of gymnasts to successfully perform horizontal bar, uneven bars and roman rings
- Rubbing of the soles with lime before going a wooden court badminton players.

8. What is projectile? Explain any three factors that affect a projectile trajectory. **(CBSE 2017)**

Ans. Refer to pages 154-155 of the book.

9. How is projectile motion influenced by:

(a) angle of projection (b) height of projection

(c) gravity (d) air resistance

(e) initial velocity (f) spin?

Ans. Refer to pages 154-156 of the book

10. Explain why are the angles of release for shot put, javelin and discus throws different.

(CBSE SP 2015)

Ans. The angles of release for shot put, javelin and discus throws are different because each event requires a different type of throw to achieve the greatest distance. In shot put, the optimal angle of release is typically between 35 and 40 degrees. This allows the shot to travel the farthest distance horizontally while still having enough height to clear the throwing area. In javelin, the optimal angle of release is typically between 30 and 35 degrees. This allows the javelin to gain the greatest amount of height, allowing for the greatest distance travelled. In discus, the optimal angle of release is typically between 42 and 45 degrees. This allows the discus to gain the greatest amount of lift and fly in a more horizontal path, maximising the distance travelled. Thus, each event has a unique optimal angle of release based on the type of throw that is most effective for that particular event.

E. Long Answer Type Questions

1. Discuss Newton's laws of motions and their application in sports.

Ans. Newton's laws of motion and their applications in sports are:

- The first law (Law of inertia): A body at rest will continue in its state of rest and a body in motion will remain in its state of uniform motion in the same direction unless an external force acts on them. That means that only an external force can change the uniform motion in a body. For example, a sprinter running a track will tend to retain that motion until she/he uses her/ his muscular force to overcome the state. The force may also be gravitational force, the surface of the field, brakes caused by an opponent, etc. This law is used in the starting techniques of sports such as rowing, sprinting, hammer throw, etc. and landing in gymnastics.
- The second law (Law of acceleration): A change in acceleration of a body is directly proportional to the force acting on it and inversely proportional to the mass of the body. It means, if two unequal forces are applied to objects of similar mass, the object on which the greater force is applied will move faster. If the masses of the two objects are different, then the object with the lighter mass will move faster. This can be shown as under:

$$F = m\,a$$

  An example of batting in cricket will clear it. When a ball is hit, the change in speed depends on the force with which it has been hit, or when an athlete with mass m improves the strength of her/his legs the acceleration will be greater. In hammer throw, the physically stronger player will throw it harder than her/his opponents of lesser strength.
- The third law (Law of reaction or Law of counterforce): For every action, there is always an equal and opposite reaction. It

means that if an object A applies force F_A to object B, then the object also exerts an equal and opposite force F_B to object A. For example, A is pushed forward by the reaction of a force equal and opposite in strength to its thrusts.

2. Explain the meaning and types of equilibrium.

Ans. Refer to pages 150-151 of the book.

3. Explain two factors that influence the centre of gravity.

Ans. Refer to page 150 of the book.

4. What is equilibrium? Explain its types along with the factors increasing equilibrium.

Ans. Refer to pages 150-151 of the book.

5. What are various types of friction? How is friction advantageous or disadvantageous in the field of games and sports? Explain with suitable examples. **(CBSE 2017)**

Ans. The various types of frictions are:

- Static Friction
- Dynamic Friction

The Dynamic Friction is further divided into:

- Sliding Friction
- Fluid Friction
- Rolling Friction

Friction has its disadvantages in some of the games and sports. It plays a large role in the field of games and sports. Without the help of friction, a player won't be able to give a better performance. In skiing, the frictional forces that come into play are friction from snow, air friction and friction from the surface of the ski. A perfect control of all the frictional forces acting is required for winning. In the game of soccer, frictional forces acting between the shoes and the ground allows the players to run. In the same way, the friction between the shoes and the ball allows them to take control of the ball.

Friction has its disadvantages, too. In cycling, every cyclist has to overcome the resistance provided by air. The friction between the tyres and the road should be should be small so that lesser energy is utilised in overcoming the friction. A stronger friction is a disadvantage in cycling. The same goes for skating; lesser friction is required for a better performance.

6. Define projectile and explain any two factors affecting projectile with the help of examples from sports. **(CBSE SP 2022)**

Ans. Refer to pages 154-155 of the book.

7. Discuss the factors that affect projectile motion.

Ans. Refer to pages154-156 of the book.

8. Is projectile advantageous in games and sports? Justify.

Ans. Projectiles are advantageous in games and sports because they allow athletes to throw, hit or kick an object with greater force and accuracy.

For example, in basketball, a player can shoot the ball using a projectile motion to increase the chances of making the shot. In tennis, a player can use a projectile motion to hit the ball harder and further, making it more difficult for the opponent to return. In baseball, a pitcher can use a projectile motion to throw the ball with greater speed and accuracy, making it harder for the batter to hit.

Projectiles also allow athletes to overcome obstacles, such as walls or defenders, by throwing or kicking the ball over them. This adds a new dimension to the game and requires athletes to develop their skills and strategies accordingly.

Overall, the use of projectiles in sports provides athletes with a greater range of options, allowing them to execute more complex and effective moves to win the game.

F. Value-Based Question

During practice sessions for an athletic meet to be held on Sports Day, Drishti performed well. But sometimes she felt that there was some problem with balancing the body during the run. Hashima, one of her friends, advised her to use spiked shoes in place of normal shoes during practice. It helped Drishti a lot and she overcame the problem of being unbalanced on the track.

Answer the following questions based on the above passage:

1. What is friction?

2. What are the advantages of friction?

3. What are the values shown by Hashima?

Ans. 1. Friction is a force developing on the surface of contact of two bodies and which opposes their relative motion.

2. The friction plays a large role in the field of games and sports. Use of spiked shoes help the athlete to achieve a perfect balance during the race. Also, in the game soccer, frictional forces acting between the shoes and the ground allows the players to run.

3. Caring, friendliness and sympathy are the values shown by Hashima.

CHAPTER 9

PSYCHOLOGY IN SPORTS

P. 171–175

A. Objective Type/Multiple-Choice Questions

I. Multiple-Choice Questions:

1. Emotionally unstable, anxiety, sadness are attributes of which personality dimension?

(a) Extroversion

(b) Neuroticism

(c) Agreeableness

(d) Openness **(CBSE 2020)**

Ans. (b) Neuroticism

2. Jung classified the personality in the following ways: **(CBSE 2020)**

(a) Introvert and Extrovert

(b) Calm and Even-tempered

(c) Musculature Structure

(d) Introvert and Melancholic

Ans. (a) Introvert and Extrovert

3. A person who likes to learn new things, new concepts and new experiences is categorised as _____ **(CBSE SP 2022)**

(a) agreeableness (b) extraversion

(c) conscientiousness (d) openness

Ans. (d) openness

4. Big Five is also known as _____

(a) ocean. (b) beach.

(c) bear. (d) pond.

Ans. (a) ocean.

5. According to the Five Factor Model, which component of personality is associated with irritability, nervousness and emotional instability?

(a) Extraversion (b) Neuroticism

(c) Conscientiousness (d) Openness

Ans. (b) Neuroticism

6. Aggressive behaviour of a sportsperson is influenced by _____

(a) emotional identification with the team.

(b) tactical ability.

(c) goal orientation.

(d) all of these.

Ans. (d) all of these.

7. Which one of the following is a correct statement in relation to aggression according to the Instinct Theory?

(a) Aggression is learned through copying the behaviour of others.

(b) Aggression is an inbuilt emotion.

(c) Aggression is a result of prevention from achieving a goal.

(d) Aggression is a result of certain external stimuli.

Ans. (b) Aggression is an inbuilt emotion.

8. Instrumental and hostile are the types of _____

(a) injuries. (b) exercise.

(c) aggression, (d) none of these.

Ans. (c) aggression,

9. Which of the following is not necessary for enhancing the self-esteem of a player?

(a) Calling her/him by name

(b) Respecting her/him

(c) Asking her/his gender

(d) Appreciating her/his efforts

Ans. (c) Asking her/his gender

10. An athlete is having doubt about her/his own skills during a match. She/he is showing

(a) Positive self-talk

(b) Negative self-talk

(c) Instructional self-talk

(d) None of these

Ans. (b) Negative self-talk

II. Match the following:

List I – Components of Factor Model	List II – Traits
(i) Conscientiousness	(1) Assertive
(ii) Extraversion	(2) Dependability
(iii) Agreeableness	(3) Compassionate
(iv) Neuroticism	(4) Anxious

Select the correct set of options:

(a) (i)–(3), (ii)–(4), (iii)–(2), (iv)–(1)

(b) (i)–(2), (ii)–(1), (iii)–(3), (iv)–(4)

(c) (i)–(1), (ii)–(3), (iii)–(4), (iv)–(2)

(d) (i)–(3), (ii)–(2), (iii)–(1), (iv)–(4)

Ans. (b) (i)–(2), (ii)–(1), (iii)–(3), (iv)–(4)

III. Assertion-Reason Type Questions: CBQ

Given below are the two statements labelled Assertion (A) and Reason (R).

A: We, each of us, are unique individuals.

R: No two persons will behave the same way, have the same preferences, the same mannerisms.

In the context of the two statements given above, which one of the following is correct?

(a) Both (A) and (R) are true and (R) is the correct explanation of (A).

(b) Both (A) and (R) are true but (R) is not the correct explanation of (A).

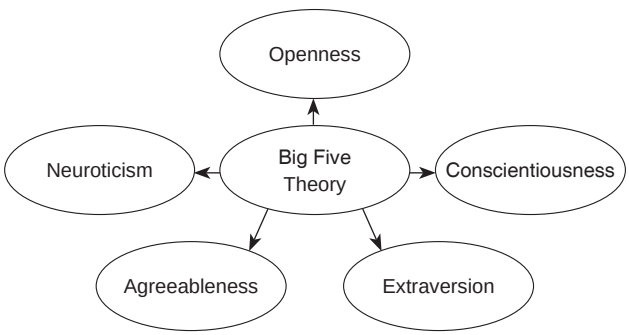
(c) (A) is true, but (R) is false.

(d) (A) is false, but (R) is true.

Ans. (a) Both (A) and (R) are true and (R) is the correct explanation of (A).

IV. Data-Based Questions: CBQ

Many psychologists believe that there are five basic dimensions of personality, often referred to as the 'Big five personality traits'.



On the basis of given figure, answer the following questions:

1. The Big Five Theory is usually also known as

(a) CEANO. (b) OCEAN.

(c) EANCO. (d) CANEO.

2. Ranjana is a conscientious person. She issued a book of psychology from library. She will _____

(a) return the book late with pages folded.

(b) return the book after due date.

(c) lose the book.

(d) return the book on time and in good condition.

3. Puneet agreed to enroll for a trek after being forced by his friend. He does not want to go as he wishes not to get out of his comfort zone. What does Puneet lack?

(a) Conscientiousness

(b) Openness to new experiences

(c) Agreeableness

(d) Introversion

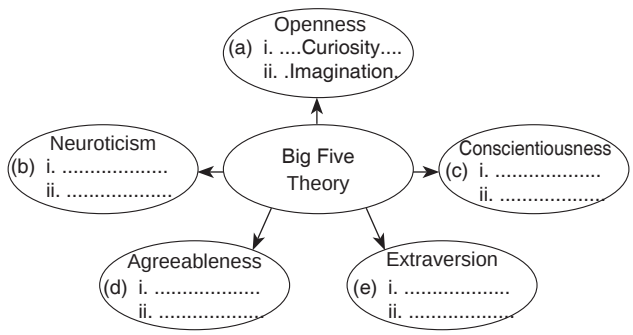
Ans. 1. (b) OCEAN

2. (d) return the book on time and in good condition.

3. (b) Openness to new experiences

V. Picture-Based Questions: CBQ

In the picture given below, personality types of Big Five Theory have been mentioned. Complete each personality type with any two of its characteristics. One has been done for you.



Ans. (b) i. emotionally unstable ii. Irritable

(c) i. thoughtfulness ii. Discipline

(d) i. kind ii. Helpful

(e) i. outgoing ii. sociable

VI. Case-Based Questions: CBQ

Kamal is a football player of Adarsh School. He is famous for his aggressive play in the field. Because of his aggression he scored many goals. At the same time, he was punished for his aggressive behaviour with opponent.

1. What level of aggression is needed in sports?

(a) Partially (b) Fully

(c) No need (d) None of these

2. Hostile aggression is also known as _____ aggression.

(a) Reactive (b) Channelled

(c) Assertive (d) Instrumental

3. Which of the following is a learned behaviour?

(a) Hostile aggression

(b) Instrumental aggression

(c) Assertive behaviour

(d) None of these

Ans. 1. (a) Partially

2. (b) Reactive

3. (c) Instrumental aggression

B. Very Short Answer Type Questions

1. Define personality.

Ans. Personality is a set of enduring traits, behaviours, and patterns of thought that shape an individual's unique characteristics, attitudes and behaviours.

2. What are the two attitudes distinguished by Carl Jung?

Ans. The two clear-cut, mutually exclusive attitudes are:

- introversion
- extraversion.

3. What do you mean by the Big Five Theory?

Ans. The Big Five Theory, also known as the Five Factor Model, is a widely accepted framework for understanding personality. It identifies five broad dimensions of personality: Openness, Conscientiousness, Extraversion, Agreeableness and Neuroticism.

4. Define aggression in sports.

Ans. Aggression in sports refers to behaviour that is intended to physically or verbally harm others, including opponents, teammates, or officials, and can result in penalties, sanctions, or even disqualification.

5. What is hostile aggression?

Ans. A person showing hostile behaviour intends to solely harm the opponent. They are driven by anger and their act is impulsive. A hostile aggressor finds validation for her / his behaviour in the pain and injury caused to the other party.

6. What is instrumental aggression?

Ans. This type of aggression is called channelled aggression also. Instrumental aggression is accompanied not by anger but with the desire to win the competition or to establish some sort of an external goal.

7. What is mental imagery?

Ans. Mental imagery or visualisation means imagination in the mind. Visualisation or mental rehearsal are other terms for imagery.

8. What is positive self-talk?

Ans. Positive Self-talk is a motivational talk. For example, an athlete says to herself/himself that she/he can perform well.

9. Explain the term 'Realistic' in goal setting principles. **(CBSE 2015)**

Ans. The term 'Realistic' in goal-setting principles refers to setting goals that are achievable and within one's capabilities, taking into account available resources, time constraints, and other practical considerations.

10. What is goal setting? **(CBSE 2014)**

Ans. Goal setting is a development of an action plan designed to motivate a person.

C. Short Answer Type-I Questions

1. What are the different dimensions of personality?

Ans. Refer to page 164 of the book.

2. List the classification of personality by Carl Jung.

Ans. Refer to pages 164–165 of the book

3. What are the five components of Big Five Theory?

Ans. The Big Five Theory proposes that personality can be described by five broad dimensions: Openness to Experience (imagination, creativity, openness to new experiences), Conscientiousness (responsibility, organisation, dependability), Extraversion (sociability, assertiveness, positive emotions), Agreeableness (compassion, cooperation, friendliness), and Neuroticism (anxiety, moodiness, emotional instability). These five components provide a comprehensive framework for understanding individual differences in personality.

4. How does instinct theory explain aggression?

Ans. The instinct theory of aggression suggests that aggression is an innate and biologically determined behaviour that is necessary for survival and reproduction. According to this theory, aggression is a natural response to threats or challenges to one's physical or social well-being. However, modern research suggests that aggression is a complex behaviour that is influenced by a variety of environmental and psychological factors, and not solely determined by instinct.

5. What are the different types of aggression?

Ans. Refer to page 167 of the book

6. What are the benefits of positive mental imagery in sports? Write about any two.

Ans. Positive mental imagery in sports can have several benefits, including:

i. Improving self-confidence and reducing anxiety: Visualizing successful performance can increase self-confidence and reduce anxiety, leading to better performance.

ii. Enhancing skill acquisition and performance: Mentally rehearsing skills can improve neural connections and muscle memory, leading to better performance during actual competition.

7. Write any two ways to improve the low self-esteem.

Ans. Two ways to improve low self-esteem are:

i. Practice self-compassion: Treat yourself with kindness and understanding, and avoid harsh self-criticism. Focus on your strengths and achievements rather than your flaws and failures.

ii. Set achievable goals: Set small, achievable goals that can build your confidence and sense of accomplishment. Celebrate your successes, no matter how small, and learn from setbacks without getting discouraged.

8. What is PETTLEP framework?

Ans. The PETTLEP framework is a model used in sport psychology to enhance motor learning and performance. The acronym stands for Physical, Environment, Task, Timing, Learning, Emotion and Perspective. The framework is used to identify the key elements of a sport skill or performance and to develop specific mental training techniques tailored to each element. By breaking down a skill into its component parts and addressing each element systematically, athletes can improve their performance and achieve their goals.

D. Short Answer Type-Ii Questions

1. Personality and posture are the two opposite sides of the same coin. Comment. **(CBSE SP 2016)**

Ans. Posture is the position in which we hold our body upright against gravity while standing, sitting, walking, running or lying down. The force of gravity acts upon our body constantly. If the muscles of our body are weak, we may suffer from postural deformities such as kyphosis, lordosis, scoliosis, bow legs, knock knee, flatfoot, etc. It is because of these deformities, our working efficiency usually gets reduced.

Personality refers to an individual's characteristic patterns of thought, emotion and behaviour together with the psychological mechanism hidden or not behind those patterns. Based on these differences, it is wrong to say that posture and the personality are the same. Personality is a psychological system that shape her /his mind and influences her/his behavioural expression while the posture is static and dynamic. It is a homeostatic mechanism that can be voluntary controlled to a significant extent by bone adjustments. Hence, the proverb can be justified.

2. What are the different dimensions of personality? Write in brief about two. **(CBSE 2017)**

Ans. Personality is a complete unit in itself and are composed of:

- Physical dimension
- Mental dimension
- Social dimension and
- Emotional dimension.

(i) **Emotional dimension:** Every person has various emotions like pleasure, hope, hate, anger, lustre, etc. If an individual does not have appropriate control over these emotions, he may become abnormal and uncontrollable. There are many situations in sports where sports persons show their emotional status. Emotional stability plays a very important part of one's personality. Therefore, sports and games do help in developing these emotions and tend to enable them to have proper control over these emotions.

(ii) **Mental dimension:** Sports and games provide ample opportunities for individual to participate in creative experience. There is no doubt that individuals learn to make judgements, utilise reflective and creative thinking and obtain knowledge about the rules and regulations of games and sports.

3. Create a mind map including Jung's classification of human personalities.

Ans. Refer to pages 164–165 of the book

4. What are the components of personalities as categorised by the Big Five Theory?

Ans. Refer to page 165–166 of the book

5. Elaborate any three components of Big Five Theory of personality.

OR

Make a table explaining any three personalities from Big Five Theory and their characteristics. **(CBSE SP 2022)**

Ans. The components of personality as characterised by Big Five Theory are as follows:

- Openness: It means more than being frank and expressive. It refers to a high level of receptivity towards new ideas and challenges. Open individuals have an adventurous and curious spirit, immense imagination and the ability to examine abstract ideas.

- Conscientiousness: These features traits like thoughtfulness, discipline, focus, commitment, strong impulse control and dependability. Individuals who are strong on this dimension are well-organised, dedicated and reliable.
- Extraversion: People in whom extraversion is the dominant trait are outgoing, sociable, assertive, friendly and enjoy the attention of others. They make a lot of friends and speak freely.
- Agreeableness: Agreeable people are kind, compassionate, helpful, warm and trusting of others. They are interested in other people, show a healthy level of empathy and enjoy being good friends. The people who are low in agreeableness have little empathy and cooperativeness.
- Neuroticism: Neurotics are emotionally unstable; they are irritable, nervous, anxious, quick to worry even over the smallest matters, and often fall into depression.

6. Define aggression. Discuss any two types of aggression. **(CBSE 2022)**

Ans. Refer to pages 166–167 of the book

7. What causes aggression in sports? Briefly discuss.

Ans. There are different theories to explain what induces aggression in sports. These are as under:

- Instinct theory: This theory states that aggression is an inbuilt emotion in human beings, and that sports provides a medium for releasing it in a safe and controlled manner.
- Social learning theory: This theory claims that aggression is learned through observing and copying the behaviour of others.
- Frustration – Aggression theory: It states that the aggression is a result of prevention from achieving a goal.
- Revised frustration – Aggression theory: Frustration does not by default cause aggressive behaviour but prepares an individual for it. For aggressive behaviour to occur, certain stimuli have to act first, such as events or objects that have an aggressive meaning to the players, an aggressive temperature, etc.

8. How does hostile aggression differ from instrumental aggression?

Ans. A person showing hostile behaviour intends to solely harm the opponent while a person with instrumental aggression desires to win the competition or to establish some sort of an external goal. A person with hostile aggression is driven by anger and their act is impulsive while a person with instrumental aggression is accompanied not by anger.

9. What is instructional self-talk? Explain with example.

Ans. Instructional self-talk is a type of positive self-talk used by athletes to focus their attention, regulate their emotions, and improve their performance. It involves using self-directed statements to guide one's actions and thoughts during a task or competition. For example, a tennis player might say to themselves "keep your eye on the ball" or "follow through on your swing" to help maintain focus and execute the desired action. The self-talk should be short, positive, and specific to the task at hand.

10. Why is goal setting important?

Ans. Goal setting is important because it provides a clear direction and purpose for individuals and teams, enhances motivation and commitment, and helps to focus attention and efforts on specific tasks and outcomes. Goals provide a framework for monitoring progress, evaluating performance, and making adjustments as necessary. By setting and achieving goals, individuals can build confidence, competence, and a sense of achievement, leading to greater satisfaction and success.

E. Long Answer Type Questions

1. What is personality? Explain its different dimensions. **(CBSE 2017)**

Ans. Personality is a psychological system that shapes the mind and influences the behavioural expression. The different dimensions of personality are:

- Physical dimension: It is considered the most important dimension of personality. All individuals are impressed by persons who have good physique. We know that physical structure of an individual is related to the heredity but certain traits of one's personality can be improved in certain environment.
- Social dimension: It also plays a very important role is personality dimensions. A good personality is one which is sociable. There are some important and essential traits of personality which includes character, etiquettes, work ethics, attitude, cooperation, sympathy, kindness, etc. These traits are developed in the surroundings where he brought up.

- Emotional dimension: Every person has various emotions like pleasure, hope, hate, anger, lustre, etc. If an individual does not have appropriate control over these emotions, he may become abnormal and uncontrollable. There are many situations in sports where sports-persons show their emotional status. Emotional stability plays a very important part of one's personality. Therefore, sports and games do help in developing these emotions and tend to enable them to have proper control over these emotions.
- Mental dimension: Sports and games provide ample opportunities for individual to participate in creative experience. There is no doubt that individuals learn to make judgements, utilise reflective and creative thinking and obtain knowledge about the rules and regulations of games and sports.

2. Describe how Jung classified human personalities.

Ans. Refer to pages 164–165 of the book.

3. What are the personality traits according to the Big Five Theory? **(CBSE 2022)**

Ans. The Big Five Theory proposes that personality can be described by five broad dimensions:

i. Openness : characterised by imagination, creativity, and a willingness to explore new ideas and experiences.

ii. Conscientiousness: characterised by being organised, responsible and dependable.

iii. Extraversion: characterised by sociability, assertiveness, and a tendency towards positive emotions.

iv. Agreeableness: characterised by compassion, cooperation and friendliness.

v. Neuroticism: characterised by anxiety, moodiness and emotional instability. These dimensions provide a comprehensive framework for understanding individual differences in personality.

4. Write a note on the Big Five Theory.

Ans. Big Five Theory or Five Factor Model, was the culmination of decades of exploration on the subject of personality. It was the culmination of decades of exploration on the subject of personality. The Big Five Theory states five components of human personality as follows.

- Openness: In this context openness means more than being frank and expressive. It refers to a high level of receptivity towards new ideas and challenges. Open individuals have an adventurous and curious spirit, immense imagination and the ability to examine abstract ideas.
- Conscientiousness: Conscientiousness features traits such as thoughtfulness, discipline, focus, commitment, strong impulse control and dependability. Individuals who are strong on this dimension are well organised, dedicated to plans and schedules, meticulous with details and reliable.
- Extraversion: People in whom extraversion is the dominant trait are outgoing, sociable, assertive, friendly and enjoy the attention of others.
- Agreeableness: Agreeable people are kind, compassionate, helpful, warm and trusting of others.
- Neuroticism: Neurotics are emotionally unstable. They are irritable, nervous, anxious, quick to worry even over the smallest matters, and often fall into depression.

5. Participation in sport results in all-round development of personality. Justify.

(CBSE SP 2015)

Ans. Sports play an important role in the development of personality of an individual. They are as significant as that of a balanced diet. At an individual level, sports and games act as an indispensable vehicle which leads to physical, mental, social, emotional and moral development of that individual. Sports play a vital role in the harmonious development or all round development of personality of an individual. Hence, we justify that sports and games contribute towards all round development like physically, mentally, intellectually, socially and emotionally.

6. What do you mean by aggression? What causes it in sports? Describe the types of aggressions observed in sports.

Ans. According to Baron and Richardson, aggression "Any form of behaviour towards the goal of harming or injuring another living being who is motivated to avoid such treatment" is called aggression.

Causing of aggression: The following are the causes of the aggression:

- Instinct theory: This theory states that aggression is an inbuilt emotion in human beings and that sports provides a medium for releasing it in a safe and controlled manner.
- Social learning theory: Aggression is learned through observing and copying the behaviour of others.

- Frustration–aggression theory: Aggression is a result of prevention from achieving a goal. Frustration is the sole cause of aggression.
- Revised frustration–aggression theory: For aggressive behaviour to occur, certain stimuli have to act first, such as events or objects that have an aggressive meaning to the player an aggressive temperament.

Types of aggression: The following are the types of aggression:

- Hostile aggression.
- Instrumental aggression.
- Assertion.

7. Discuss the role of psychologist for a team preparing to participate in competition.

(CBSE SP 2016)

Ans. The roles of sports psychologists varies depending their nature of qualifications or other qualities. However, the main role of psychologist for preparing a team to participate in competition can be listed as under to help athletes cope with performance:

- Help athletes to improve mental skills for performance.
- Help athletes to prepare for competition.
- Help athletes come back after injury.
- Help athletes to improve practice efficiently.
- Help athletes cope with performance fears.

8. Explain Jung's classification of personality and explain its importance in physical education and sports.

Ans. Refer to pages 164–165 of the book.

9. Write about any two psychological attributes in detail.

Ans. Two psychological attributes are as follows:

i. Self-esteem is a psychological attribute that reflects an individual's overall self-worth and confidence. It can impact an individual's behaviour, emotions and social interactions. Individuals with high self-esteem tend to have a positive self-image, self-respect and are less susceptible to negative influences. Low self-esteem can lead to negative self-image, self-doubt and depression. Developing self-compassion, challenging negative self-talk and setting achievable goals are ways to improve self-esteem.

ii. Mental imagery is a psychological technique used to enhance performance and learning in sports and other activities. It involves creating vivid and realistic mental images of a desired outcome or action. By using mental imagery, individuals can enhance their focus, motivation and confidence, and improve their performance in a range of activities. Mental imagery can be used for skill acquisition, technique improvement, or to manage anxiety and stress. It involves creating a mental script of the desired outcome, including sensory details such as visual, auditory and tactile cues.

10. What is self-talk? Describe its types with example.

Ans. Refer to page 169 of the book.

11. What are different types of goals? Explain briefly.

Ans. Refer to page 170 of the book.

F. Value-Based Question

Advika was a good athlete of her school. She used to undergo training regularly for the best results. In spite of her constant effort, she could not succeed. She got frustrated with her poor performance and stopped expressing her feelings and meeting friends. She took the help of her Physical education teacher. The PE teacher suggested her to start practising positive self-talk and mental imagery. After a few weeks, she was able to focus well and succeeded.

Answer the following questions based on the above passage:

1. What are the psychological attributes that help a player to become successful in her/his games?

2. What is positive self-talk?

3. What values were shown by the PE teacher?

Ans. 1. The psychological attributes that help a player to become successful in their games are positive self-talk and mental imagery.

2. Positive self-talk is a psychological technique in which an individual uses positive statements to boost their confidence and self-esteem. It involves using affirmations or self-talk to motivate oneself and focus on positive outcomes, rather than negative ones.

3. The PE teacher showed empathy, concern, and a willingness to help Advika. The teacher suggested a practical solution to her problem and provided guidance and support to help her improve her performance. The teacher also demonstrated a belief in Advika's ability to succeed and encouraged her to adopt positive self-talk and mental imagery techniques. These values are essential for effective coaching and can help individuals overcome obstacles and achieve their goals.

CHAPTER 10

TRAINING IN SPORTS

P. 193–198

A. Objective Type/Multiple-Choice Questions

I. Multiple-Choice Questions:

1. Which organisation in India is involved in talent search at grassroots level?

(a) Fit India

(b) Indian Olympic Association

(c) Sports Authority of India

(d) Athletic Association of India

Ans. (c) Sports Authority of India

2. Which among the following training cycles has a duration of 3 to 6 weeks?

(a) Microcycle (b) Mesocycle

(c) Macrocycle (d) None of these

Ans. (b) Mesocycle

3. What is the ability of a muscle to overcome resistance for as long as possible known as?

(a) Strength endurance

(b) Explosive strength

(c) Maximum strength

(d) Isometric strength

Ans. (a) Strength endurance

4. Take off in long jump is an example of _____ strength. **(CBSE SP 2022)**

(a) explosive strength

(b) maximum strength

(c) strength endurance

(d) static strength

Ans. (b) maximum strength

5. In which form of exercise resistance is accommodated throughout the range of motion and the contractions are performed at a dynamic preset fixed speed?

(a) Isokinetic exercises

(b) Isometric exercises

(c) Isotonic exercises

(d) All of these

Ans. (a) Isokinetic exercises

6. Jumping on the spot is an example of_____ **(CBSE SP 2022)**

(a) Isometric (b) Isotonic

(c) Isokinetic (d) Isokinesthetic

Ans. (b) Isotonic

7. Pushing against a stationary wall is an example of

(a) eccentric exercise.

(b) isometric exercise.

(c) isotonic exercise.

(d) isokinetic exercise.

Ans. (b) isometric exercise.

8. Which of these is an example of an isometric exercise? **(CBSE 2020)**

(a) Plank hold (b) Push up

(c) Running (d) Weightlifting

Ans. (a) Plank hold

9. The principal of 'effort and recovery' is the foundation of which training method?

(a) Continuous training

(b) Interval training

(c) Periodic training

(d) Fartlek method

Ans. (b) Interval training

10. Which of the following factors does not influence flexibility?

(a) The anatomical structure of a joint

(b) Proper warming-up

(c) Body temperature

(d) None of these

Ans. (d) None of these

11. Which of the following is not a categorisation of endurance using nature of the activity as a parameter?

(a) Basic endurance

(b) General endurance

(c) Specific endurance

(d) Speed endurance

Ans. (d) Speed endurance

12. Milind is preparing for an upcoming marathon by running 400 m distances 15 times every day. Which method for developing endurance is he following?

(a) Continuous training method

(b) Interval training method

(c) Fartlek method

(d) Pace constant method

Ans. (b) Interval training method

13. Fartlek training was developed in **(CBSE 2020)**

(a) Sweden. (b) The USA.

(c) India. (d) The UK.

Ans. (a) Sweden.

14. Which of the following is not a characteristic and significance of coordinative abilities?

(a) Be a source of recreation and recovery

(b) Decide the lifestyle and physical ailments

(c) Determine the pace of learning and

(d) Decide the quality of a performance modification of skills

Ans. (b) Decide the lifestyle and physical ailments

15. What type of speed is defined as the ability to maintain maximal speed for maximal distance and maximal duration?

(a) Acceleration ability

(b) Locomotor ability

(c) Movement ability

(d) Reaction ability

Ans. (b) Locomotor ability

16. What kind of coordinative ability is defined as the ability to determine the position of the body and its parts in time and space with respect to gravity and moving objects?

(a) Combinatory ability

(b) Balance ability

(c) Orientation ability

(d) Differentiation ability

Ans. (c) Orientation ability

17. If a muscle contracts and changes its length to produce force, the contraction type is _____ **(CBSE 2020)**

(a) isotonic. (b) isometric.

(c) isokinetic. (d) none of these.

Ans. (a) isotonic.

II. Match the following:

List I – Type of Endurance	List II – Example
(a) Speed	(1) 1,500 m race
(b) Short-term	(2) 800 m race
(c) Middle-term	(3) 5,000 m race
(d) Long-term	(4) 400 m sprint

Select the correct set of options:

(a) (i)–(4), (ii)–(2), (iii)–(1), (iv)–(3)

(b) (i)–(2), (ii)–(1), (iii)–(3), (iv)–(4)

(c) (i)–(1), (ii)–(3), (iii)–(4), (iv)–(2)

(d) (i)–(3), (ii)–(2), (iii)–(1), (iv)–(4)

Ans. (a) (i)–(4), (ii)–(2), (iii)–(1), (iv)–(3)

III. Assertion-Reason Type Questions: CBQ

Given below are the two statements labelled Assertion (A) and Reason (R).

A: Strength is the ability of a muscle or a group of muscles to exert maximum force against a resistance in a single contraction.

R: For someone to remain physically fit, it is important to have muscular strength.

In the context of the two statements given above, which one of the following is correct?

(a) Both (A) and (R) are true and (R) is the correct explanation of (A).

(b) Both (A) and (R) are true but (R) is not the correct explanation of (A).

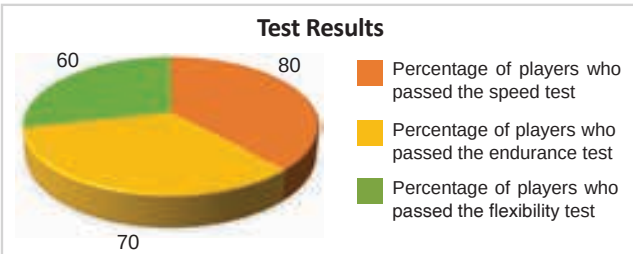
(c) (A) is true, but (R) is false.

(d) (A) is false, but (R) is true.

Ans. (b) Both (A) and (R) are true but (R) is not the correct explanation of (A).

IV. Data-Based Questions: CBQ

A random test conducted on a state cricket team gave the following results:



On the basis of the pie-chart given above, answer the following questions:

1. The players who could not pass the endurance test, they should train using .....

(a) specific endurance training method.

(b) continuous or interval training method.

(c) general endurance training method.

(d) none of these.

2. Acceleration Run and Pace Run can be the two methods of improving .....

(a) speed. (b) flexibility.

(c) endurance. (d) consistency.

3. What are the necessary steps in improving flexibility?

(a) Warming up

(b) Breathing deep and slow

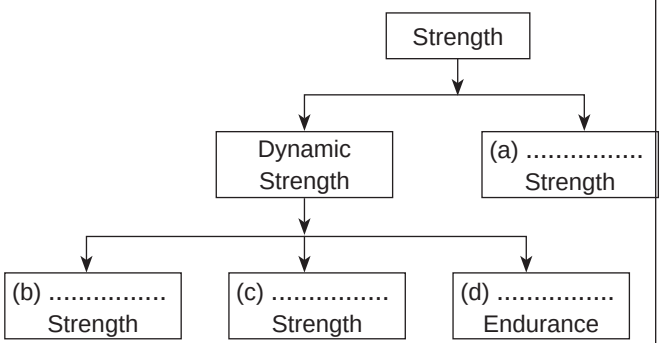
(c) Repetition of exercise

(d) All of these

Ans. **1.** (b) Continuous or interval training method; **2.** (a) Speed; **3.** (d) All of these

V. Picture-Based Questions: CBQ

Observe and complete the mind map of strength and its types.



Ans. (a) Static

(b) Maximum

(c) Explosive

(d) Strength

VI. Case-Based Questions: CBQ

1. Ajay was a good thrower. When he joined a new training camp, he observed there that some athletes were running on uneven surfaces like bushes, rocks, pits, etc. He was in dilemma. Then, the coach explained about that training in detail.

(a) What type of training are they doing?

(b) Stretching exercise improves _____

(c) Fartlek training is also known as _____

(d) What is the average timing of Fartlek training?

Ans. (a) Fartlek training

(b) Flexibility

(c) Speed play

(d) 45 minutes

2. Look at the given pictures and answer the following questions.

(a) What type of strength do the given pictures depict?

(b) This strength is the ability of a muscle to overcome _____ at high speed.

(c) This strength stimulates _____ muscle fibres.

(d) What are the benefits of this type of strength?

Ans. (a) Explosive strength

(b) resistance

(c) type II fast-twitch

(d) These types of type –II muscle fibres improve intramuscular coordination and reaction time, in addition to making the connective tissues and muscles more elastic and sturdy.

B. Very Short Answer Type Questions

1. What steps does talent identification and development involve?

Ans. Talent identification and development involve the identification of potential talent, training and coaching to develop skills, monitoring progress, and providing opportunities to compete at higher levels.

2. Define sports training.

Ans. Sports training refers to the process of improving athletic performance through structured and systematic physical and mental conditioning, including skill development, strength and conditioning, and mental preparation.

3. What are the two types of muscular strength?

Ans. Isotonic and Isometric strength

4. What is dynamic strength?

Ans. Dynamic strength is also known as Isotonic strength. It is the type of strength that comes into play in the movement of muscles, i.e. shortening and lengthening of muscles.

5. Explain why isometric exercises can be performed anywhere.

Ans. Isometric exercise can be done anywhere for the reason that this type of exercises do not need any specialised equipment nor are they time-consuming.

6. Define isokinetic exercises.

Ans. Isokinetic are the exercises in which the muscles contract with maximum force through every point in the range of motion. They involve specific muscle contractions that can only be executed with the use of specialised complex equipment called dynamometers.

7. Define endurance.

Ans. Endurance is the ability to resist fatigue for a prolonged duration of time. It can be defined as "endurance is the result of the physiological capacity of the individual to sustain movement over a period of time".

8. What is a continuous training method?

Ans. In continuous training method, a load is applied for a long duration without any break. For performing the continuous training method, the intensity is kept low and the time restricted to half an hour although, this duration may be expanded as per the capacity of the training individual.

9. What do you mean by the interval training method?

Ans. The interval training method is executed with repeated efforts at a fast pace, with intervals of incomplete recovery in between. The aim is to increase the heartbeat to 170–180 beats per minute.

10. What happens in the Fartlek method?

Ans. In this method, the change in intensity is decided by the surface of running, the surroundings, the athlete's physical strength and limitations, the climate, etc.

11. What is speed?

Ans. Speed is the ability to produce the greatest possible impulse at the shortest possible time.

12. 'Pace races mean, running the whole distance of a race at a constant speed'. Which are the races included in pace races? **(CBSE 2015)**

Ans. Pace runs are characterised by uniform speed. This means that the athlete runs the course of the race at a steady and definite speed. This method is applied to races of 800 m and above.

13. How is active flexibility different from passive flexibility?

Ans. Active flexibility is different from passive flexibility on the following grounds: In active flexibility no external force is applied. The range of motions is performed using the individual's own muscular force. It is lesser in force than passive flexibility, while a passive flexibility is the ability to perform a range of movements with greater ease through external help. It enables the individual to assume and hold a position without her/his own muscular power.

14. Suggest any two isometric exercises for shoulder region. **(CBSE 2015)**

Ans. The two isometric exercises for shoulder region are:

(i) Shoulder presses

(ii) Dumb-bell curls.

15. What is coordinative ability? **(CBSE SP 2016)**

Ans. Coordinative abilities are abilities that enable an individual to do various related activities properly and efficiently. Since it is the ability to execute and control movements, it is a salient part of every sport, whether combative or individual.

C. Short Answer Type-I Questions

1. What is talent identification?

Ans. Talent identification in sports refers to the process of identifying individuals who have the potential to excel in a particular sport. It involves the assessment of physical and psychological characteristics, skills, and performance indicators to determine an individual's talent and potential for development. Talent identification is an important part of athlete development programs and can help to identify future stars in sports.

2. How does National Talent Search Scheme work in India?

Ans. Refer to pages 177–178 of the book.

3. What are different sports training cycles?

Ans. Refer to page 178 of the book.

4. What are the duration of micro-, meso- and macrocycles?

Ans. The duration of micro-, meso- and macrocycles can vary depending on the training program and the athlete's needs. Generally, a microcycle lasts for 7 days, a mesocycle for 3 to 6 weeks, and a macrocycle for 3 to 12 months. The duration can be adjusted based on the athlete's progress and goals.

5. What are different types of strength?

Ans. Refer to pages 180–181 of the book.

6. Differentiate between isotonic strength and isometric strength.

Ans. Isotonic strength refers to the ability of a muscle to produce force through a range of motion, such as lifting weights or performing bodyweight exercises like push-ups. Isometric strength refers to the ability of a muscle to produce force without changing its length, such as holding a plank or a wall sit. Isotonic exercises involve movement, while isometric exercises involve holding a position.

7. How is endurance categorised?

Ans. Refer to pages 183–184 0f the book.

8. What are the different methods of developing endurance?

Ans. Refer to pages184–185 of the book.

9. List down any four advantages of Fartlek training method. **(CBSE SP 2022)**

Ans. Fartlek training is a type of interval training that incorporates varying intensity levels and terrains. Some advantages of Fartlek training are:

i. Improved cardiovascular fitness: Fartlek training can increase endurance and overall cardiovascular health.

ii. Enhanced mental toughness: The unpredictable nature of Fartlek training can help athletes push through mental barriers and improve their mental toughness.

iii. Versatility: Fartlek training can be adapted to different sports and fitness levels, making it a versatile training method.

iv. Variety: The variation in intensity and terrain can keep workouts interesting and engaging, preventing boredom and burnout.

10. What are different types of speed?

Ans. Refer to page 187 of the book.

11. What are the methods to develop speed?

Ans. Refer to pages 187–188 of the book.

12. What is active and passive flexibility?

(CBSE 2022)

Ans. **Active Flexibility:** In active flexibility, no external help is required. The range of motions is performed using the individual's own muscular force. It is lesser in force than passive flexibility.

Passive Flexibility: Passive flexibility is the ability to perform a range of movements with greater ease through external help. It enables the individual to assume and hold a position without her/his own muscular power. For example, doing stretches with the help of a partner. It is influenced by factors like the anatomical structure of joints and the extensibility of the ligaments.

13. Mention the different type of flexibility.

Ans. Refer to pages 188–189 of the book.

14. Mention any three guidelines for improving flexibility.

Ans.
- Warm-up is necessary before performing flexibility exercises in order to avoid overstretching the muscles, which may damage ligaments or joints. A light warm-up involving continuous, dynamic efforts, for example, light running for 5 minutes, will suffice.
- Quick and sudden movements should be avoided before the muscles have warmed-up enough.
- Slow and deep breathing help while performing stretches.

15. Write any two types of coordinative abilities with suitable examples. **(CBSE 2022)**

Ans. (i) Combinatory Ability: Combinatory ability is the ability of a sportsperson to systematically combine movements from different parts of the body into a whole, as observed in combative sports like boxing and gymnastics. It relies on the efficiency of kinaesthetic and optic sense organs.

(ii) Orientation Ability: It is the ability of a sportsperson to determine the position of the body and its parts in time and space with respect to gravity, moving objects like ball, opponent, partner, and playground, etc. This ability is also dependent on the functional capacity of kinaesthetic and optic sense organs and vestibular apparatus.

D. Short Answer Type-II Questions

1. Create a mind map on the classification of the process of talent identification and development along with their key components.

Ans. Refer to Figure 10.1 of page 177 of the book.

2. Write any three steps involved in talent identification and development?

Ans. Steps:

i. Talent detection: potential sportspersons are discovered.

ii. Talent identification: participants who have the potential to become elite performers are recognised.

iii. Talent development: suitable learning environment is provided to athletes to enhance their potential.

3. How is talent identification important?

Ans. Talent identification is important in the following manner:

i. It helps in the discovery of great talents.

ii. It helps in recognising the hidden talents.

iii. It helps talented students/children recognised at early stage to show their talent at the extreme.

iv. It helps in finding big assets for schools/ colleges/ state/country.

4. Define macrocycle with example.

Ans. A macrocycle is a long-term training period that is typically designed to cover an entire competitive season or a year. It includes several mesocycles and microcycles. An example of a macrocycle could be a training plan for a professional soccer team that spans one full season, consisting of several mesocycles and microcycles within it.

5. Make a list of factors that determine muscular strength.

Ans. Muscular strength is determined by several factors:

- the cross-sectional area of muscle fibres recruited to generate force, as a larger diameter of the muscle translates to bigger muscular strength.
- the volume of fast-twitch (phasic) muscle fibres, as these muscles contract faster.
- the volume of phosphagen storage, as these high-energy phosphate compounds can supply energy to the muscles in the absence of the main sources of energy.
- body weight, as being overweight means having more weight to move.
- limb length, as persons with shorter limbs have better leverage.
- muscle length, as those with longer muscles have the advantage of developing the size and strength of their muscles to a greater degree.

6. Briefly discuss the three types of isotonic strength.

Ans. The three types of Isotonic strength are:

- Maximum strength: It is the ability of a muscle to overcome resistance of a maximum intensity of stimulus in a single contraction. Applying this strength demands an efficient neuromuscular coordination. It activates type II fast-twitch muscle fibres. It increases the levels of muscle-building hormones and enhances bone density and strength.
- Explosive strength: It is the ability of a muscle when exerting force against a strong stimulus within a short period of time, that is the ability to overcome resistance at high speed. Like maximum strength, explosive strength also stimulates type II fast-twitch muscle fibres. It improves intramuscular coordination and reaction time, in addition to making the connective tissues and muscles more elastic and sturdy.
- Strength endurance: It is the ability of a muscle to overcome resistance for as long as possible. Usually displayed in activities that require a relatively long duration of muscle tension with minimal decrease in efficiency, it is most effective in sports.

7. Make a table to differentiate between isometric and isotonic exercise with suitable examples. **(CBSE 2022)**

Ans. Difference between:

Isometric Exercise	Isotonic Exercise
Static exercises, with no movement in the joint or limb.	Dynamic exercises, involving movement of the joint or limb.
Resistance is provided without any change in the length of the muscle.	Resistance is provided throughout the full range of motion of the muscle.
No visible movement occurs	Visible movement occurs
Examples include planks, wall-sits, and static bicep curls.	Examples include bicep curls, push-ups, and squats.
Benefits include increased strength, improved stability, and improved bone health.	Benefits include increased strength, improved muscular endurance, and improved cardiovascular health.

8. What are the two types of contractions involved in isotonic exercises?

Ans. There are two stages of isotonic exercises based on the type of contraction: concentric and eccentric. In concentric contraction, the muscle is shortened to produce force. An example can be studied in the use of biceps curl, which involves curling the arm to bring the weight up to chest level. In eccentric

contraction, the muscle under tension is lengthened, as observed during lowering weights. When performed at high intensity, it is far more effective at increasing muscle mass and strength than concentric contraction.

9. What is endurance? Explain its types.

(CBSE 2017)

Ans. Endurance is the ability to resist fatigue for a prolonged duration of time.

The types of endurance are:

- Basic endurance: It is an individual's ability to resist fatigue when applied to loads of medium intensity stimulus and aerobic muscular metabolism.
- General endurance: It is the ability to tolerate endurance exercise and resist fatigue caused by various kinds of activities.
- Specific endurance: It is the ability to resist fatigue caused by a specific or particular sports activity.

10. What is Fartlek training? Write in brief.

(CBSE 2017)

Ans. It is the method used for developing endurance. In this method self-discipline plays a vital role.

The duration of training depends upon the experience of athlete but it last as envisaged for 45 minutes but varies from aerobic walking to anaerobic sprinting. 'fartlek' word is a Swedish word which means 'speed play'. It is a training method that blends continuous training with interval training. It lays emphasis on both aerobic and anaerobic system. In this method pace or speed is not pre-planned and, therefore, it is left to the discretion of individual.

11. What are the salient features of the Fartlek training method? **(CBSE SP 2021 Term 2)**

Ans. Refer to page 185 of the book.

12. What do you mean by interval training and how endurance can be developed by this method?

(CBSE 2016)

Ans. The interval training method is executed with repeated efforts at a fast pace, with intervals of incomplete recovery in between. It involves a series of low-intensity workouts intercepted with rest or relief periods. The aim is to increase the heartbeat to 170–180 beats per minute. For this reason the heart rate is monitored and it is often referred to as training of the heart. Since, endurance is the ability to sustain an activity, therefore, the method of interval training is a well-designed method to develop the endurance. We know that the interval method is executed with repeated efforts so are the endurance.

13. Define flexibility and its types. **(CBSE 2020)**

Ans. Flexibility is the ability to exhibit a wide range and amplitude of movements by an individual's joints. With greater flexibility, the individual can efficiently perform various motions, whether they are complicated or ordinary. Moreover, flexibility reduces the amount of time required by an athlete to perfect targeted moves, reduces fatigue and risk of injuries, as well as increases strength, speed and endurance.

Flexibility can be divided into two types:

(i) **Passive Flexibility:** Passive flexibility is the ability to perform a range of movements with greater ease through external help. It enables the individual to assume and hold a position without her/his own muscular power. For example, doing stretches with the help of a partner. It is influenced by factors like the anatomical structure of joints and the extensibility of the ligaments.

(ii) **Active Flexibility:** In active flexibility, no external help is required. The range of motions is performed using the individual's own muscular force. It is lesser in force than passive flexibility.

14. Discuss in detail about slow stretching and holding as method for developing flexibility.

(CBSE 2016)

Ans. Static Stretching Method: In static stretching, the muscle is stretched to its maximum limit and then released gradually to return to its original position. The duration of stretching varies according to the requirement of the individual. For cooling down, 10 seconds can be applied, and for flexibility stretches, 30 seconds will suffice. This method is considered better and safer as there are fewer chances of getting injured.

Stretching and holding as method for developing flexibility is the extension of slow stretching method. In this method, the muscle is stretched to its maximum limit and then the position is held for few seconds before returning to the original position.

15. Define speed and elaborate any one method to develop speed. **(CBSE 2020)**

Ans. Refer to pages 186–187 of the book.

16. List factors that determine speed.

Ans. The following factors determine speed:

- The personal attitude and work ethic of the athlete.

- The amount of energy stores – both the main and supplementary.
- The flexibility and durability of the muscles.
- The explosive strength of the individual's muscles.
- The successful coordination between motor and sensory nerves.
- The structure of the muscle fibres.

17. What is the significance of coordinative abilities?

Ans. Coordinative abilities refer to a set of physical abilities that enable an individual to perform complex movements and tasks with accuracy and efficiency. These abilities include balance, reaction time, rhythm, orientation, differentiation and coupling. They are essential in sports and physical activities that require precise and coordinated movements, such as gymnastics, dance and martial arts. The development of coordinative abilities helps athletes to improve their technique, speed, agility and overall performance. They also contribute to injury prevention by enhancing body control and spatial awareness. Therefore, the training of coordinative abilities should be an integral part of any sports or physical activity program.

E. Long Answer Type Questions

1. Describe in detail about the key components of talent identification.

Ans. Refer to pages 176-177 of the book.

2. Differentiate between macro-, meso- and micro-cycles.

Ans. Macrocycle, mesocycle, and microcycle are the three stages of periodisation used in sports training to organise and plan training sessions.

i. Macrocycle: It is the longest period of training, usually spanning from six months to one year. It involves planning the overall training goals and objectives and includes multiple mesocycles. For example, a macrocycle for an Olympic athlete preparing for the upcoming Games could be one year long, broken down into several mesocycles of different training focuses such as strength building, endurance building, and skill development.

ii. Mesocycle: It is the intermediate stage of training, spanning from several weeks to a few months. It includes specific training phases within the macrocycle, which are designed to meet the objectives of the overall training plan. For example, within the strength building mesocycle, there could be several phases, such as hypertrophy and maximal strength.

iii. Microcycle: It is the shortest stage of training, lasting from several days to one week. It includes daily and weekly training plans with specific training sessions and rest periods. For example, within the hypertrophy phase of a mesocycle, a microcycle could include three days of weight training and two days of rest. In summary, the macrocycle is the long-term plan, mesocycle is the intermediate plan, and microcycle is the short-term plan. The main goal is to structure the training program effectively, promote progressive adaptation and avoid overtraining.

3. Discuss in detail the methods of improving muscular strength.

Ans. Development of strength brings about a holistic improvement to the body. It upgrades speed, agility and flexibility-qualities that are advantageous for all individuals in general, but sportspersons in particular. The latter group of specialists have to overcome one or more of the four types of resistance with their strength:

- Resistance of the implements to be used, such as javelin in javelin throw, weight in weight lifting and so on.
- Resistance of their own body, in jumping, sprinting, etc.
- Resistance of their opponent, in combative sports.
- Frictional resistance of external forces, as experienced in swimming, rowing, cycling, etc.

4. What are the types of strength? Explain isotonic method to improve strength.

OR

Write in detail about the strength improving method – isometric, isotonic and isokinetic.

(CBSE 2019)

Ans. Muscular strength broadly classified as:

I. Isotonic strength: There are three types of isotonic strength:

(i) Maximum strength

(ii) Explosive strength

(iii) Strength endurance

II. Isometric strength

(For detailed description refer to p-181 of the book)

OR

Isometric or Static Exercise: In isometric exercises, a group of muscles develops tension against another group of muscles without any changes in the length of the muscles. There are two variations of isometric exercises: overcoming and yielding. In the first type the joints and muscles apply force to an immovable object, and in the second, they are held in a static position while opposed by resistance. The main advantage of isometric exercises is the strengthening of the muscles due to longer duration of the systematic contraction with relatively little loss of energy. They can be performed anywhere as they do not need any equipment.

Isotonic Exercises: In isotonic exercises, the muscles visibly contact with varying tension while working against a constant load. Unlike isometric exercises, isotonic exercises accomplish work, as both muscles and joints move and change their direction. There are two stages of isotonic exercises based on the type of contraction: concentric and eccentric. In concentric contraction, the muscle is shortened to produce force. In eccentric contraction, the muscle under tension is lengthened, as observed during lowering weights. When performed at higher intensity, it is far more effective at increasing muscle mass and strength than concentric contraction. The advantages of isotonic exercises are enhancement of coordination and strength, development of speed and endurance and increase in length and flexibility of the muscles.

Isokinetic Exercises: In Isokinetic exercises, the muscles contract with maximum force through every point in the range of motion. In isokinetic exercises resistance is accommodated throughout the range of motion and the and the contractions are performed at a dynamic pre-set fixed speed. The speed therefore remains constant even if the amount of force exerted varies as per the strength and ability of the individual performing the exercise. Isokinetic exercises are considered the best method for improving explosive strength and strength endurance. The one disadvantage is that they can be performed with the use designated machines.

5. Define endurance and discuss the methods of endurance development. **(CBSE 2022)**

Ans. Refer to pages 183–184 of the book.

6. Discuss types of endurance.

Ans. The types of endurance are:

- Basic endurance: It is an individual's ability to resist fatigue when applied to loads of medium intensity stimulus and aerobic muscular metabolism. In this type of endurance, a large number of muscles are involved and the movements are performed at a slow and steady pace for a longer duration of time.
- General endurance: It is the ability to tolerate endurance exercises and resist fatigue caused by various kinds of activities. Activities involved general endurance can be either aerobic or anaerobic. The duration is shorter in comparison to basic endurance but it enables an athlete to undergo various kind of activity within getting tired.
- Specific endurance: Specific endurance can be defined as the ability to resist fatigue caused by a specific or particular sports activity. Different sports trigger different levels of fatigue; consequently, specific endurance can show variations.

7. Discuss the methods of improving endurance.

Ans. The methods that can improve the endurance are:

- Continuous training method: In this method a load is applied for a long duration without any break. Its intensity is kept low and the time frame restricted to half an hour.
- Interval training method: It is executed with repeated efforts at a fast pace, with intervals of incomplete recovery in between. The aim is to increase the heartbeat to 170–180 beats per minute.
- Fartlek method: In this method the change is decided by the surface of running, the surroundings, the athlete's physical strength and limitations, the climate, etc. For instance, terrains can switch from woody areas to riversides and hills. It accounts for both the aerobic and anaerobic systems of the body. The pulse rate should remain within 140 to 180 beats per minute, with duration of training lasting 45 minutes on an average.

8. What does the word 'training' mean in sports? Explain any two methods of speed development in detail. **(CBSE 2012)**

Ans. Sport performance training simply put is a type of training that is designed to improve your fitness level for the purpose of improving sense of improving your ability to perform a given sport.

The two methods of speed development are:

- Acceleration run: We have learnt that this run of an object is the rate at which its speed changes. When an athlete sprints, she/he does not simply start running at maximal speed; it is attained through gradual increment. This principle is used in acceleration run mode of developing speed.
- Pace run: Unlike acceleration runs, paced runs are characterised by uniform speed. This means that the athlete runs the course of the race at a steady and definite speed.

9. Make a table defining speed and its types, and methods to develop speed.

Ans. Table defining speed and its types and methods to develop speed:

Concept	**Definition**	**Types**	**Methods** to develop speed
Speed	The ability to produce the greatest possible impulse at the shortest possible time	Reaction ability, Acceleration ability, Locomotor ability, Movement ability, Speed endurance	Acceleration run, pace run

Acceleration ability: The ability to increase speed rapidly from a stationary position.

Speed endurance: The ability to maintain a high speed over a prolonged period of time.

Reaction ability: The ability to react quickly to a stimulus.

Locomotor Ability: It is the ability to maintain maximal speed for maximal distance and maximal duration, applied in events such as 200 m and 400 m races, speed skating, swimming and so on.

Resistance training: Exercises using weights or resistance to improve strength, power, and speed.

Movement Ability: It is the ability of a muscle or a group of muscles to contract at maximal speed in a single course of movement.

10. Explain the methods of flexibility development in detail. **(CBSE 2014)**

Ans. The following methods are used to improve flexibility:

- Ballistic method: In this method, the movement is performed with rhythmic swinging in the maximum range that can be obtained. The involved joint is stretched with a swing, keeping the count in mind. At each count, the joint is stretched to the maximum limit and then flexed. To avoid overstretching the joint, the individual should warm-up.
- Static stretching method: In static stretching, the muscle is stretched to its maximum limit and then released gradually to return to its original position. The duration of stretching varies according to the requirement of the individual. For cooling down, 10 seconds can be applied, and for flexibility stretches, 30 seconds will suffice. This method is considered better and safer as there are fewer chances of getting injured.
- Dynamic stretching method: Dynamic stretching method uses active muscular movement that brings about stretching but is not held in the end position. This takes soft tissues to their full length and then after a brief pause of 3 to 5 seconds, the stretched muscle contracts and the tendons and muscles exert a force in the lengthened position. The movement should start at half speed repetitively for a couple of times, and be followed by full speed after that.
- Post-isometric stretch: This method is based on Proprioceptive Neuromuscular Facilitation (PNF) technique, which raises the active and passive range of motion and improves motor performance. The muscle is first contracted maximally for 6–8 seconds using the isomeric method, and then stretched to its maximum limit. This final position is held for 8 to 10 seconds. For best results, this exercise may be repeated 4 to 8 times.

11. Define flexibility along with its types. Explain any two methods used to develop flexibility.

(CBSE SP 2022)

Ans. Refer to pages 188–189 of the book.

12. Define coordinative abilities and discuss their characteristics and significance.

Ans. Coordinative abilities are abilities that enable an individual to do various related activities properly and efficiently. Its definition can be:

"Coordinative abilities are understood as relatively stabilised and generalised patterns of motor control and regulation processes." These enable the sportsman to do a group of movements with better quality and effect".

Characteristics and significance of coordinative abilities are:

- Coordinative abilities are directly linked to the technical aspects and skills of sports.
- The central nervous system and the various sense organs should work in tandem.

- It determines the pace of learning and modification of skills.
- It can be a source of recreation and recovery.
- If development of coordinative abilities is initiated from an early stage, then the individual will have an easier time acquiring complex skills in later years.

13. What are the different types of coordinative abilities? **(CBSE 2019)**

Ans. The different kinds of coordinative abilities are:

- Combinatory ability
- Orientation ability
- Reaction ability
- Balance ability
- Adaptation ability
- Differentiation
- Rhythm ability

(For detailed description, refer pages 190–191 of the textbook.)

F. Value-Based Question

Deepti wanted to be a good athlete. So, she tried her best to reduce her time in 800 m race, but in vain. She is very keen to win a state level championship in 800 m race for her school. She started regular practice and worked hard for it. Soumya, her friend, suggested to her to take help of PE teacher Mr Harish.

The PE teacher advised her to increase strength, flexibility and coordinative abilities like balance, rhythm, etc. He suggested different exercises to improve strength, flexibility and endurance. After six months of training, she won gold medal in 800 m race for her school, thus her dream came true.

Answer the following questions based on the above passage:

1. What is the importance of coordinative abilities?

2. What is endurance?

3. Write the values shown by the PE teacher.

Ans.

1. Coordinative abilities help to execute and control movements.

2. It is the ability to sustain an activity.

3. The values shown by the PE teacher that he is caring and concerned.