

## Sample Question Paper Standard (Code 041)

Time Allowed: 3 hours

Maximum Marks: 80

### General Instructions:

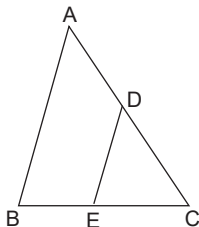
1. This Question Paper has 5 Sections A, B, C, D and E.
2. Section A has 20 Multiple-Choice Questions (MCQs) carrying 1 mark each.
3. Section B has 5 Short Answer-I (SA-I) type questions carrying 2 marks each.
4. Section C has 6 Short Answer-II (SA-II) type questions carrying 3 marks each.
5. Section D has 4 Long Answer (LA) type questions carrying 5 marks each.
6. Section E has 3 Case Based integrated units of assessment (4 marks each) with sub-parts of the values of 1, 1 and 2 marks each respectively.
7. All Questions are compulsory. However, an internal choice in 2 Questions of 2 marks, 2 Questions of 3 marks and 2 Questions of 5 marks has been provided. An internal choice has been provided in the 2 marks questions of Section E.
8. Draw neat figures wherever required. Taken  $\pi = \frac{22}{7}$  wherever required if not stated.

### Section - A

Section A consists of 20 questions of 1 mark each.

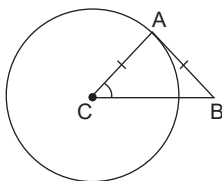
1. If  $a = 3 \times 5$ ,  $b = 3 \times 5^2$  and  $c = 2^5 \times 5$ , then LCM ( $a, b, c$ ) and HCF ( $a, b, c$ ) are  
(a) 1200, 5      (b) 2400, 5      (c) 2400, 15      (d) 1200, 15
2. What will be the zero of polynomial  $px^2 + qx + r$ , if  $p + r = q$ ?  
(a) 1      (b) 0      (c) -1      (d) -2
3. What will be the nature of roots of quadratic equation, if coefficient of  $x^2$  and constant term have opposite signs?  
(a) Not real      (b) Real, Equal      (c) Real, Distinct      (d) Any type
4. For what value of P, the system of equations  $(3P + 1)x + 3y = 2$  and  $(P^2 + 1)x + (P - 2)y = 5$  is inconsistent?  
(a) 0      (b) -1      (c) 2      (d) 1
5. How many numbers lie between 10 and 300, which when divided by 4 leave remainder 2?  
(a) 72      (b) 73      (c) 71      (d) 74
6. Find the sum of all 13 terms of an AP, whose middle term is 38.  
(a) 494      (b) 496      (c) 480      (d) 488

7. Coordinates of point C of an isosceles triangle ABC having points A(2, -2) and B(-4, 2) is  
 (a) (1, 0)                      (b) (-1, 0)                      (c) (-2, 0)                      (d) (2, 0)
8. Centre of a circle whose end points of a diameter are (3, 2) and (-3, 4) is  
 (a) (3, 1)                      (b) (1, 1)                      (c) (-3, 1)                      (d) (0, 3)
9. In the given figure,  $\Delta ABC$  have  $DE \parallel AB$  and  $AD = 2x$ ,  $DC = x + 3$ ,  $BE = 2x - 1$ ,  $CE = x$ . The value of  $x$  will be



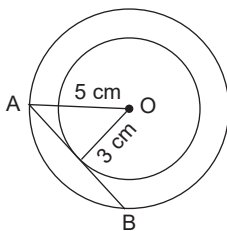
- (a)  $\frac{1}{5}$                       (b)  $\frac{2}{5}$                       (c)  $\frac{3}{5}$                       (d)  $\frac{4}{5}$

10. In the given figure,  $\Delta ABC$  is an isosceles triangle, such that AB is tangent to circle with centre C. Then angle ACB is equal to



- (a)  $45^\circ$                       (b)  $90^\circ$                       (c)  $60^\circ$                       (d)  $35^\circ$

11. In the given figure, the length of PB is



- (a) 9                      (b) 5                      (c) 8                      (d) 4

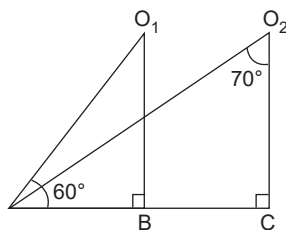
12. If  $\tan(3x + 30^\circ) = 1$ , the value of  $x$  is

- (a) 20                      (b) 0                      (c) 5                      (d) 10

13. If  $x + 2 = \cot^2 A (1 + \sec A)(1 - \sec A)$ , then  $x =$

- (a) -1                      (b) -3                      (c) -2                      (d) 0

14. In the given figure, the angles of depression from point  $O_1$  and  $O_2$  of object A are respectively

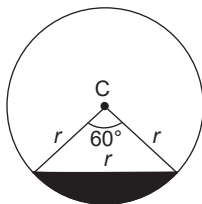


- (a)  $(20^\circ, 60^\circ)$       (b)  $(70^\circ, 70^\circ)$       (c)  $(20^\circ, 70^\circ)$       (d)  $(60^\circ, 60^\circ)$

15. The length of second's hand of a clock is 23 cm. The distance covered by its tip in 42 seconds is

- (a) 116.86 cm      (b) 84.26 cm      (c) 96.62 cm      (d) 101.20 cm

16. The area of shaded part (segment) as shown in the figure will be



- (a)  $\frac{r^2(\pi - \sqrt{3})}{6}$       (b)  $\frac{r^2(2\pi - 3\sqrt{3})}{12}$       (c)  $\frac{r^2(2\pi - \sqrt{3})}{4}$       (d)  $\frac{r^2(\pi - 3)}{4}$

17. If the radius of cone and its slant height are halved, then the new total surface area will be

- (a) one-fourth      (b) doubled      (c) halved      (d) same as original

18. A hemispherical bowl of radius 15 cm is filled with conical candies of radius 1 cm and height 2.5 cm. If the bowl is only  $\frac{3}{4}$ th filled with candies, find the number of candies in the bowl.

- (a) 1225      (b) 3225      (c) 2225      (d) 4225

**Direction:** In the question numbers 19 and 20, a statement of Assertion (A) is followed by a statement of Reason(R).

**Choose the correct option**

19. **Statement A (Assertion):** For a certain frequency distribution, median is 240, mode is 250 and mean is 230.

**Statement R (Reason):** Mean, median and mode of observations can be calculated by,  $\text{Mode} = 3 \times \text{Median} - 2 \times \text{Mean}$

- (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).  
 (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).  
 (c) Assertion (A) is true but reason (R) is false.  
 (d) Assertion (A) is false but reason (R) is true.

20. **Statement A (Assertion):** A deck of cards contains 52 cards of which 16 are face cards.

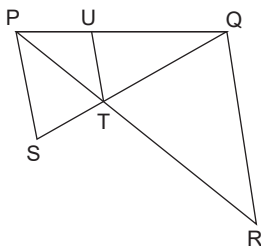
**Statement R (Reason):** Probability of drawing a red colour card is  $1/2$ .

- (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
- (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
- (c) Assertion (A) is true but reason (R) is false.
- (d) Assertion (A) is false but reason (R) is true.

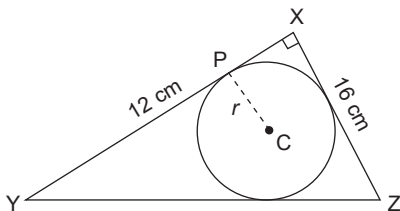
**Section - B**

Section B consists of 5 questions of 2 marks each.

- 21. Prove that  $\sqrt{7} - \sqrt{2}$  is an irrational number.
- 22.  $\Delta PQR$  and  $\Delta PSQ$  have  $PS \parallel QR$ . A line  $TU$  parallel to  $PS$  passes through both the triangles. If  $PS = 18$  cm,  $QR = 36$  cm and  $ST = 13$  cm, find the lengths of  $TQ$  and  $TU$ .



- 23. In the given figure,  $\Delta XYZ$  is a right triangle with angle  $X = 90^\circ$  and sides  $XY = 12$  cm and  $XZ = 16$  cm. Find the radius of the circle.



or

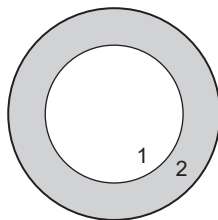
ABC is an isosceles triangle, in which  $AB = AC$ , circumscribed about a circle. Show that  $BC$  is bisected at point of contact.

- 24. If  $\operatorname{cosec} \theta - \sin \theta = p$  and  $\sec \theta - \cos \theta = q$ . Prove that  $p^{4/3}q^{2/3} + p^{2/3}q^{4/3} = 1$

or

Prove that,  $\sin^6 \theta + \cos^6 \theta = 1 - 3 \sin^2 \theta \cos^2 \theta$ .

25. A round signboard has two different shaded regions as shown in the figure. If diameters of the regions are in ratio 4 : 5. Find the ratio of the areas of these regions.



### Section - C

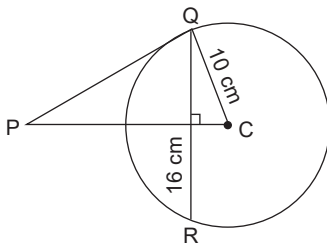
Section C consists of 6 questions of 3 marks each.

26. At a clock tower, six bells rang at intervals of 2, 4, 6, 8, 10 and 12 minutes. If all of them rang together at 9 a.m., then how many times do they rang together between 9 a.m. and 9 p.m.?
27. If  $\alpha$  and  $\beta$  are the zeroes of quadratic polynomial  $f(x) = px^2 + qx + r$ , find the value of  $p\left(\frac{\alpha^2}{\beta} + \frac{\beta^2}{\alpha}\right) + q\left(\frac{\alpha}{\beta} + \frac{\beta}{\alpha}\right)$ .
28. During a class parade, students stand in a row. If two students are added in each row, then the resulting number of rows will be 1 less. If two students are removed from each row, there will be 2 extra rows. Find the total number of students in parade.

or

8 men and 12 women can finish a work in 10 days, while 6 men and 8 women can finish it in 14 days. Find time taken by 1 man alone to finish the work, also find time taken by 1 woman alone to finish the work.

29. In the given figure, QR is chord of length 16 cm of a circle whose radius is 10 cm. A tangent drawn from P touches circle at Q. Find PQ.



30. If  $\sec \theta + \tan \theta = a$ , find  $\operatorname{cosec} \theta$ .
31. Mode of given data is 67. Find  $x$

Class interval	40 – 50	50 – 60	60 – 70	70 – 80	80 – 90
Frequency	5	$x$	15	12	7

or

Find the mean marks from the data:

Marks	Below 10	Below 20	Below 30	Below 40	Below 50
Number of students	5	9	17	29	44
Marks	Below 60	Below 70	Below 80	Below 90	Below 100
Number of students	60	70	78	83	85

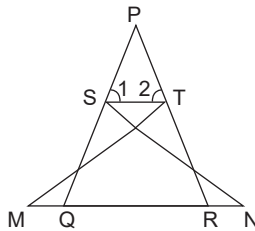
### Section - D

Section D consists of 4 questions of 5 marks each.

32. A pole has to be erected at a point on boundary of a circular park of diameter 17 m in such a way, that difference of its distances from two diametrically opposite fixed gates A and B on boundary is 7 m. Find distances from the two gates where pole is to be erected.
33. Prove that, if two sides and a median bisecting the opposite side of a triangle are proportional to corresponding sides and median of another triangle, then the two triangles are similar.

or

In the figure, if  $\angle 1 = 2$  and  $\triangle NSQ \cong \triangle MTR$ , prove that  $\triangle PTS \sim \triangle PRQ$ .



34. When an object in shape of hemisphere attached to cone is immersed in a cylindrical container partly filled with water, the water level rises by 4 cm. Diameter of hemisphere is 10 cm and height of cone is 5 cm. Find the diameter of the container.

or

The height of a solid cylinder is 15 cm and its diameter is 7 cm. Two equal conical holes of radius 3 cm and height 4 cm are cut off. Find the surface area and volume of the solid?

35. 100 names were picked from a directory and distribution of number of alphabets in the name were obtained as given in the table below:

Number of alphabets	1 – 4	4 – 7	7 – 10	10 – 13	13 – 16	16 – 19
Number of names	6	30	40	16	4	4

Determine median and mean number of alphabets in the names. Also find its modal size.

## Section - E

Case Study based questions are compulsory.

36. A train has 10 coaches. Passengers are seated in a sequence with 115 passengers in first coach, 130 passengers in second coach, 145 passengers in third coach and so on.

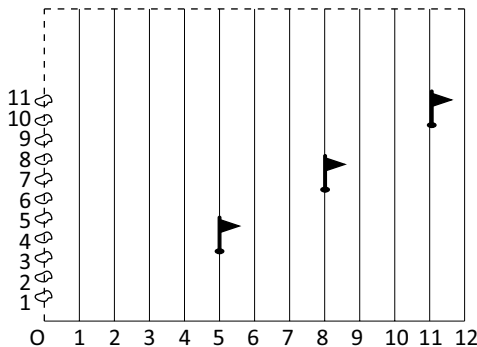


- (a) How many passengers are seated in the tenth coach? (1 mark)  
(b) How many extra passengers are seated in tenth coach as compared to fifth coach? (1 mark)  
(c) What is the difference of total fares collected between two consecutive coaches if a ticket costs ₹500? (2 marks)

or

How many total passengers are seated in the train?

37. A school celebrated its Sports day in a rectangular playground. 12 lines are drawn along the length and along the breadth of playground. Raju has been told to post a yellow flag on 5th line at distance of  $\frac{1}{10}$ th of the breadth. Sanju posted blue flag on 11th line at a distance of  $\frac{1}{8}$ th of breadth.

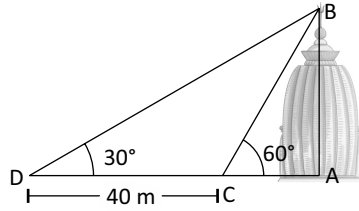


- (a) Find the coordinates of spot where Raju posted his flag. (1 mark)  
(b) Find the coordinates of spot where Sanju posted his flag. (1 mark)  
(c) If a green flag has to be posted exactly halfway between line joining yellow and blue flag, what will be its coordinate? (2 marks)

or

Find the distance between yellow and blue flag.

38. A temple is situated on a bank of river. There is a straight road passing near the temple just opposite to the other bank of river. Angle of elevation of temple top from point on road through base of temple is  $60^\circ$ . On moving further 40 m from point, the elevation is found to be  $30^\circ$ .



- (a) What is the height of temple? (1 mark)
- (b) What will be the area of triangle formed between initial point of observation to the top and base of the temple? (1 mark)
- (c) What will be the distance from base of temple to final point of observation? (2 marks)

or

What will be the distance from top of temple to the final point of observation?