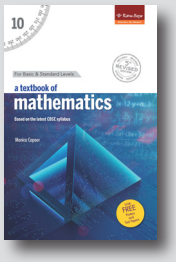


Sample Question Paper

Term 2

BASIC (241)

Time Allowed: 2 hours | Maximum Marks: 40

General Instructions:

1. The question paper consists of 14 questions divided into 3 sections A, B and C.
2. Section A comprises of 6 questions of 2 marks each. Internal choice has been provided in two questions.
3. Section B comprises of 4 questions of 3 marks each. Internal choice has been provided in one question.
4. Section C comprises of 4 questions of 4 marks each. An internal choice has been provided in one question. It contains two case study based questions.

SECTION A

1. Find the depth of a cylindrical tank of radius 3 m if its capacity is equal to that of a rectangular tank of size 18 m × 11 m × 4 m.

2. Find the middle term of the AP: 6, 13, 20, ..., 216

OR

What is the common difference of an AP in which $a_{21} - a_7 = 84$?

3. Find the median of the following distribution:

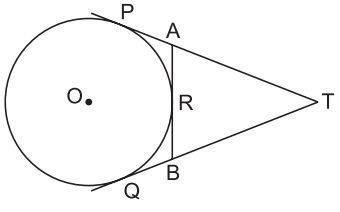
Marks	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70	70 – 80	80 – 90
Number of students	5	15	25	20	7	8	10

4. Find the non-zero value of k for which the roots of the quadratic equation $9x^2 - 3kx + k = 0$ are real and equal.

5. A point P is at a distance of 29 cm from the centre of a circle of radius 20 cm. Find the length of the tangent drawn from P to the circle.

OR

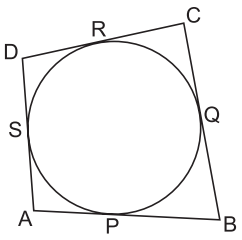
In the given figure, TP and TQ are tangents from T to the circle with centre O. R is a point on the circle. If AB is a tangent to the circle at R, prove that TA + AR = TB + BR.



6. Compute the mode of the following data:

Class interval	0 – 20	20 – 40	40 – 60	60 – 80	80 – 100
Frequency	25	16	28	20	5

SECTION B



7. A circle touches all the four sides of a quadrilateral ABCD with AB = 6 cm, BC = 7 cm and CD = 4 cm. Find AD.

8. If the sum of first 7 terms of an AP is 49 and that of the first 17 terms is 289, find the sum of first n terms of the AP.

9. From a balloon vertically above a straight road, the angles of depression of two cars on the same side at an instant are found to be 45° and 60°. If the cars are 100 m apart, find the height of the balloon.

OR

Two men on either side of a 75 m high building and in line with base of building observe the angles of elevation of the top of the building as 30° and 60°. Find the distance between two men. [Use $\sqrt{3} = 1.73$]

10. The sum of the squares of two consecutive odd positive integers is 394. Find them.

SECTION C

11. The following distribution shows the monthly pocket allowance of children of a locality. The mean pocket allowance is ₹ 53. Find the value of p.

Monthly pocket allowance (in ₹)	0 – 20	20 – 40	40 – 60	60 – 80	80 – 100
Number of children	12	15	32	p	13

OR

Find the mean of the following frequency distribution:

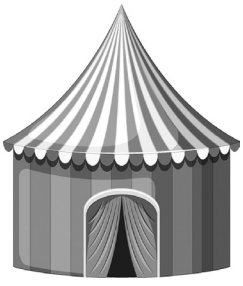
Marks	0 – 9	10 – 19	20 – 29	30 – 39	40 – 49
Number of students	2	5	7	8	11

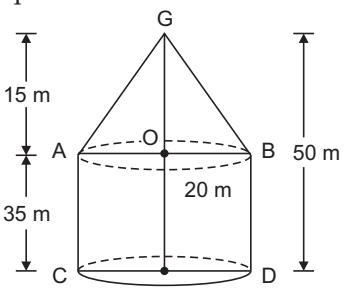
Marks	50 – 59	60 – 69	70 – 79	80 – 89	90 – 99
Number of students	12	9	7	5	4

12. Draw a circle of radius 3 cm. From a point P, 7 cm away from the centre draw two tangents to the circle. Measure the length of each tangent.

Case Study 1

13. The owner of the circus rented the ground in a certain city. A big tent was put up there. A circus tent of total height 50 metres is to be made in the form of a right circular cylinder surmounted by a right circular cone. If the height and radius of the conical portion of the tent are 15 metres and 20 metres respectively, answer the following questions.



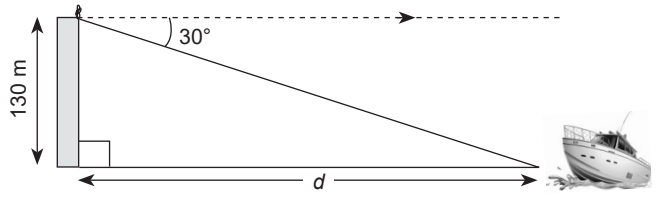


(*i*) Find the area of the canvas used for making the tent.

(*ii*) Find the cost of the cloth required, at the rate of ₹14 per square metre to make the tent. (Note that the base of the tent will not be covered with canvas.)

Case Study 2

14. Rishi was sitting on a roof from a height of 130 m above sea level. He saw a motor boat at sea at an angle of depression of 30°. Based on the above situation, answer the following questions.



(*i*) What is the angle made if a person sitting on boat and looking at Rishi? Is it true that the dotted line as shown in the figure is always parallel to *d*?

(*ii*) Calculate the horizontal distance from boat to the roof.