

SECTION – A

Question numbers 1 to 10 carry 1 mark each. For each of the questions 1-10 four alternatives choice have been provided of which only one is correct. You have to select the correct choice.

1. For a race of 1540 m number of rounds one have to take on a circular track of radius 35 m;

- (a) 5 (B) 6 (c) 7 (e) 10

1. The tops of two poles with heights 25 m and 35 m are connected by a wire, which makes an angle of elevation of 30 degrees at the top of 25 m pole. Then the length of wire is:

- (a) 26 m (b) 35 m (c) 15 m (d) 20 m

1. One coin is tossed thrice. The probability of getting neither 3 heads nor 3 tails, is:

- (a) $1/3$ (b) $3/4$ (c) $1/2$ (d) $2/3$

1. To divide a line segment PQ in the ratio 3:4, first a ray PX is drawn so that angle QPX is an acute angle and then at equal distances points are marked on the ray PX such that the minimum number of these points is:

- (a) 7 (b) 4 (c) 5 (d) 3

1. If the numbers $n - 2$, $4n - 1$ and $5n + 2$ are in A.P., then the value of n is:

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

6. If $(P + 4)z^2 + 1(P - 4)z + 1 = 0$ has equal roots, then value of P is:

- (a) $p = 3, 5$ (b) $p = -5, -3$ (c) all $p > 0$ (d) $p = 5, -3$

7. Twelve solid spheres of the same size are made by melting a solid metallic cylinder of base diameter 2cm and height 16 cm. The diameter of each sphere is:

- (a) 4 cm (b) 3 cm (c) 2 cm (d) 6 cm

8. Two chords PQ and RS intersect at T outside the circle. If $PQ = 5$ cm, $QT = 3$ cm, $TS = 2$ cm, length of RS is:

- (a) 8cm (b) 12 cm (c) 10 cm (d) 15 cm

1. The length of the tangent drawn to a circle with radius 3 cm from a point 5cm from the centre of the circle is :

- (a) 6 cm (b) 8 cm (c) 4 cm (d) 7 cm

10. A bag contains 5 black, 7 red and 3 white balls. A ball is drawn from the bag the bag at random. The probability that the drawn ball is red is:

(a) 5/15

(b) 3/15

(c) 7/15

(d) 1/15

SECTION –B

11. A card is drawn at random from a well shuffled deck of 52 cards. Find the probability of getting:

(i) A king

(ii) a king of red suit

Or

Two dice are thrown at the same time. Determine the probability that the difference between the numbers on the two dice is 2.

12. Solve the following quadratic equation by factorizations:

$$2x^2 - 5x + 2 = 0; \quad (x \text{ does not equal } 0)$$

13. Find the value of m for which the point with coordinates $(3, 5)$, $(m, 6)$ and $(1/2, 15/2)$ are collinear.

14. If the number $4p + 1$, 26 , $10p - 5$ are in A.P. Find the value of p .

15. In what ratio does the line $x - y - 2 = 0$ divide the line segment joining $(3, -1)$ and $(8, 9)$

16. In two concentric circles, prove that a chord of a larger circle which is tangent to smaller circle is bisected at the point of contact.

17. A horse is tethered to one corner of a rectangular grass field 40 m by 24 m, by a rope 14 m long. Over how much area of the field can it graze?

18. Two identical solid hemispheres of equal base radius r cm are stuck together along their bases. Find the total surface area of the combination.

SECTION –C

19. Find the sum of all three digit numbers which leave the remainder 2 when divided by 5.

20. Draw a circle of radius 6 cm. From a point 10 cm away from its centre. Construct the pair of tangents of the circle and measure their length.

21. A rectangular water tank of base 11 m multiply contains water upto a height of 5 m. If the water in the tank is transferred to a cylindrical tank of radius 3.5 m, find the height of the water level in the tank.

Or

A heap of rice is in the form of a cone of diameter 9 m and height 3.5 m. Find

The volume of the rice. How much canvas cloth is required to just cover the heap?

22. Find the roots of the questions $4/x - 3 = 5/2x + 3$, $(x \text{ does not equal } 0 \text{ and } -3/2)$

Or

Find two consecutive positive even integers, the sum of whose square is 340 .

23. Find five numbers in an A.P., whose sum is 12.5 and the ratio of first to the last is $2:3$.

24. An integer is chosen between 0 and 100. What is the probability that it is :

- (i) divisible by 7
- (ii) not divisible by 7?

25. Find the coordinates of the point P, Q and R which divide the line segment joining A(5,4) and B(11, 6) into four equal parts.

26. If the point (x,y) is equidistant from the points $(2p + q, 2q - p)$ and $(2p - q, p + 2q)$, prove that $qx = py$.

27. Draw a line segment AB of length 8 cm. Taking A as centre, draw a circle of radius 4cm and taking B as centre, draw another circle of radius 3 cm. Construct tangents to each circle from the centre of the other circle.

28. A hemispherical bowl of internal radius 9cm is full of liquid. The liquid is to be filled into cylindrical shaped bottles each of radius 1.5 cm and height 4 cm. How many bottles are needed to empty the bowl?

SECTION-D

29. Water is flowing at the rate of 5 km/h through a pipe of diameter 14 cm into a rectangular tank which is 50 m long and 44 m wide. Determine the time in which the level of water in the tank will rise by 7 cm.

30. Swati can row her boat at a speed of 5 km/h in still water. If it takes her 1 hour more to row the boat 5.25 km upstream than to return downstream, find the speed of the stream.

31. Find four terms in an A.P., whose sum is 20 and the sum of whose squares is 120.

32. A person on tour has Rs 360 for his expenses. If he extends his tour for four days, he has to cut down his daily expenses by Rs 3. Find the original duration of the tour.

33. Prove that the angle between two tangents drawn from an external point to a circle is supplementary to the angle subtended by the line segment joining the points of contact at the centre.

34. A man on the top of a vertical tower observes a car moving at a uniform speed coming directly towards him. If it takes 12 minutes for the angle of depression to change from 30 degree to 45 degree, how soon after this, will the car reach the tower? Give your answer to the nearest second.