

General Instructions:

1. All questions are compulsory.
2. The question paper consists of 34 questions divided into four sections A, B, C and D. Section – A comprises of 8 questions of 1 mark each, Section – B comprises of 6 questions of 2 marks each, Section – C comprises of 10 questions of 3 marks each and Section – D comprises of 10 questions of 4 marks each.
3. Question numbers 1 to 8 in Section – A are multiple choice questions where you are to select one correct option out of the given four.
4. There is no overall choice.
5. Use of calculator is not permitted.

SECTION – A

Question numbers 1 to 8 carry one mark each. For each question, four alternative choices have been provided of which only one is correct. You have to select the correct choice.

1. The 4th term from the end of the AP: - 11, - 8, - 5,, 49 is:
a. 37 b. 40 c. 43 d. 58
2. A secant intersects a circle at points A and B. When points A and B coincide, the secant becomes a:
a. Chord of the circle. b. radius of the circle.
c. Tangent to the circle. d. diameter of the circle.
3. Triangle ABC is right angled at B. A circle on which side as diameter will make one of the side of the triangle to the circle?
a. AC only b. BC only c. AB only d. both AB and BC
4. What is the angle of elevation of the sun when the length of the shadow of a $16\sqrt{3}$ m high pole is 48 m?
a. 30° b. 45° c. 60° d. 75°
5. If three coins are tossed simultaneously, then the probability of getting at least one head and one tail is:
a. $\frac{3}{4}$ b. $\frac{3}{8}$ c. $\frac{1}{2}$ d. $\frac{1}{4}$
6. In a single throw of two dice, the probability that neither a doublet nor a total of 9 will appear is:
a. $\frac{5}{18}$ b. $\frac{13}{18}$ c. $\frac{2}{3}$ d. $\frac{5}{36}$

7. $A(x, y)$ \quad $P(0, 4)$ \quad $B(-2, 3)$

In the above figure, $AP = PB$, so the coordinates of A are:

- a. (2, 3) b. (3, 2) c. (2, 5) d. (2, 7)

8. A funnel is a combination of:



- a. A cone and a cylinder b. frustum of cone and cylinder
c. A hemisphere and a cylinder d. a hemisphere and a cone

SECTION – B

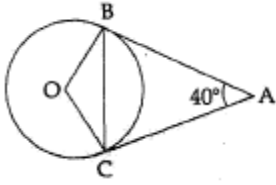
Question numbers 9 to 14 carry two marks each.

9. Find the roots of the following quadratic equations: $4x^2 - 4px + (p^2 - q^2) = 0$
10. Find the roots of the following quadratic equation, if they exist: $2x^2 - 2\sqrt{2}x + 1 = 0$
11. Point P is such that it is a distance of 9 cm from a circle of radius 8 cm. Find the length of the tangent drawn from P to the circle.
12. Locate a point on a line segment of length 10 cm which divides it internally in the ratio 3 : 7.
13. If a letter is chosen at random from letters of the word 'AGILE', find the probability that the letter is:
a. A vowel b. a consonant
14. If the area of a sector of a circle is $\frac{5}{18}$ th of the area of that circle, then find the central angle of the sector.

SECTION – C

Question numbers 15 to 24 carry three marks each.

15. Find the sum of first 17 terms of an AP whose 4th and 9th terms are (-15) and (-30) respectively.
16. If a quadratic equation $(1 + a^2)b^2x^2 + 2abcx + (c^2 - m^2) = 0$ in x has equal roots, prove that $c^2 = m^2(1 + a^2)$.
17. In the figure, AB and AC are tangents to a circle with centre O. If $\angle BAC = 40^\circ$, find $\angle BOC$ and $\angle ACB$.

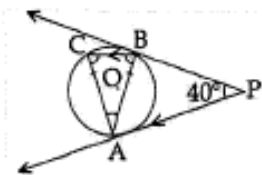


18. The angle of elevation of the sun is 60° . Find the length of the shadow cast by tree of height 12 m.
19. A (0, 0), B (6, -2) and C (8, -4) are the three vertices of a parallelogram ABCD. If E is the mid – point of DC, find the area of $\triangle ADE$.
20. Determine the ratio in which the point (6, m) divides the join of points A (9, 5) and B (4, 2). Also, find the value of m.
21. A light house throws light on the seashore upto a distance of 70 m. If the angle it makes while spreading light is 60° , find the area covered by it.
22. A hollow metallic spherical ball has outer radius 8 cm and inner radius 6 cm. Find the volume of the metal used.
23. The radii of two circles are 19 cm and 9 cm. Find the radius of the circle which has circumference equal to the sum of the circumferences of the two circles.
24. A toy is in the form of a cone mounted on a hemisphere with the same radius. The radius of the base of the conical portion is 3 cm and its height is 4 cm. Find the total surface area of the toy.

SECTION – D

Question numbers 25 to 34 carry four marks each.

25. If the list price of a toy is reduced by Rs. 2, a person can buy 2 toys more for Rs. 360. Find the original price of the toy.
26. Solve the equation: $1 + 4 + 7 + 10 + \dots + x = 287$
27. If (-5) is a root of the quadratic equation $2x^2 + px - 15 = 0$ and the quadratic equation $p(x^2 + x) + k = 0$ has equal roots, then find the values of p and k.
28. Construct a tangent to a circle of radius 3 cm from a point on the concentric circle of radius 5 cm and measure its length. Also, verify the length by actual calculation.
29. In the given figure, PA and PB are two tangents drawn to a circle with centre O. A chord BC is drawn parallel to tangent PA. If $\angle P = 40^\circ$ and $AB = AC$, find $\angle ABC$, $\angle BCA$ and $\angle BAC$.



30. A straight highway leads to the foot of a tower of height 50 m. From the top of the tower, the angles of depression of two cars standing on the highway are 30° and 60° respectively. What is the distance of the two cars and how far is each car from the tower?

