SAMPLE PAPER - 2

TIME : 3 HRS.   **MAX. MARKS : 80**

GENERAL INSTRUCTIONS :

- All questions are compulsory.
- The question paper consists of 40 questions divided into four sections A, B, C and D.
- Section A comprises of 20 questions of 1 mark each. Section B comprises of 6 questions of 2 marks each. Section C comprises of 8 questions of 3 marks each. Section D comprises of 6 questions of 4 marks each.
- There is no overall choice. However, internal choice has been provided in two questions of 1 mark each, two questions of 2 marks each, three questions of 3 marks each, and three questions of 4 marks each. You have to attempt only one of the alternatives in all such questions.
- Use of calculators is not permitted.

SECTION-A

Q.1 - 10 are multiple choice questions. Select the most appropriate answer from the given options.

1. If HCF of the smallest composite number and smallest prime number is of the form 4A then value of A is

    (1) 1   (2) 2   (3) $\dfrac{1}{2}$ (4) 0

2. If $\tan 2A = \cot(A - 18°)$ where 2A is an acute angle, then the value of A is

    (1) 12°   (2) 18°   (3) 36°   (4) 48°

3. If α, β are zeroes of polynomial $2y^2 + 7y + 5$, value of $\alpha + \beta + \alpha\beta$ is

    (1) 0   (2) –1   (3) 1   (4) None of these

4. If $x = a$; $y = b$ is solution of pair of equations $x - y = 2$ and $x + y = 4$ then a and b are

    (1) (3, 1)   (2) (1, 3)   (3) (0, 1)   (4) (–1, 2)

5. Values of 'k' for which roots of equation $x^2 + 4x + k = 0$ are real is

    (1) $k \geq 4$ (2) $k \leq 4$ (3) $k = 0$ (4) $k = 4$

6. In an AP, if common difference is –4 and seventh term is 4, then first term is

    (1) –4   (2) 4   (3) 28   (4) 20

7. ABC is an isosceles triangle right angled at C with AC = 4 cm, then length of AB is

    (1) 4 cm   (2) 8 cm   (3) $\sqrt{2}$ cm   (4) $4\sqrt{2}$ cm

8. The value of $\sin^2 33° + \sin^2 57°$ is

(1) 0   (2) 1   (3) 3   (4) 2

9. If a tower of 30 m high casts a shadow $10\sqrt{3}$ m long on the ground, then angle of elvation of the sun is

(1) 60°   (2) 30°   (3) 45°   (4) 90°

10. Volume and surface area of a solid hemisphere are numerically equal. Diameter of hemisphere is

(1) 3 units   (2) $\frac{9}{2}$ units   (3) $\frac{3}{2}$ units   (4) 9 units

Q.11 - 15 Fill in the blanks.

11. The slant height of the frustum of a cone is 5 cm. If difference between the radii of its two circular ends is 4 cm. The height of the frustum is _____.

12. If mean and median are 10.5 and 9.6 respectively then mode is _____.

13. The probability of selecting a rotten apple randomly from a heap of 900 apples is 0.18, then number of rotten apples is _____.

OR

A coin is tossed two times the probability of at least one head is _____.

14. If $x = -\frac{1}{2}$ is a solution of quadratic equation $3x^2 + 2kx - 3 = 0$, value of k is _____.

15. If $k + 1 = \sec^2\theta(1 + \sin\theta)(1 - \sin\theta)$, then the value of k is _____.

Q.16 - 20 Answer the following :

16. Has the rational number $\frac{441}{2^2.5^7.7^2}$ a terminating or a non-terminating decimal representation ?

OR

After how many decimal places will the decimal expansion of $\frac{23}{2^4 \times 5^3}$ terminate?

17. Without using trigonometric tables, find the value of the following expression :

$$\frac{\sec(90° - \theta)\csc\theta - \tan(90° - \theta)\cot\theta + \cos^2 25° + \cos^2 65°}{3\tan 27°.\tan 63°}$$

18. Is −150 a term of the AP 11, 8, 5, 2, ... ?

19. If the quadratic equation $px^2 - 2\sqrt{5}\, px + 15 = 0$ has two equal roots, then find the value of p.

20. Given $\triangle ABC \sim \triangle PQR$, if $\frac{AB}{PQ} = \frac{1}{3}$, then find $\frac{ar(\triangle ABC)}{ar(\triangle PQR)}$.

SECTION-B

21. Find how many integers between 200 and 500 are divisible by 8.

OR

Find the sum of first 8 multiples of 3.

22. Two different dice are tossed together. Find the probability that the product of the two numbers on the top of the dice is 6.

23. In figure given below, are two concentric circles of radii 6 cm and 4 cm with centre O. If AP is a tangent to the larger circle and BP to the smaller circle and length of AP is 8 cm, find the length of BP.
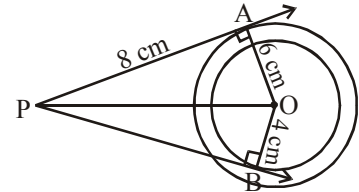
24. A rectangular sheet of paper 40 cm × 22 cm is rolled to form a hollow cylinder of height 40 cm. Find the radius of cylinder.

**25.** Show that 6^n can never end with digit 0 for any natural number n.

OR

Find the HCF and LCM of 90 and 144 by the method of prime factorization.

26. Find a relation between x and y such that the point P(x, y) is equidistant from the points A(−5, 3) and B(7, 2).

SECTION-C

27. Find all the zeroes of the polynomial $2x^4 + 7x^3 - 19x^2 - 14x + 30$, if two of its zeroes are $\sqrt{2}$ and $-\sqrt{2}$.

28. A wooden article was made by scooping out a hemisphere from each end of a solid cylinder, as shown in fig. If the height of the cylinder is 10 cm, and its base is of radius 3·5 cm, find the total surface area of the article.
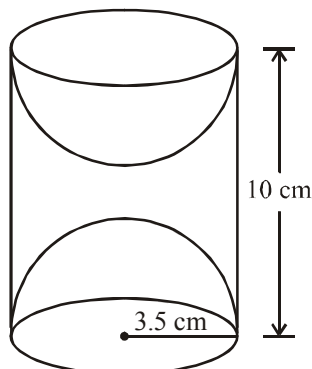

OR

A heap of rice is in the form of a cone of base diameter 24 m and height 3.5 m. Find the volume of the rice. How much canvas cloth is required to just cover the heap?

29. The table below shows the salaries of 280 persons :

| Salary (In thousand ₹)	Number of Persons
5 – 10	49
10 – 15	133
15 – 20	63
20 – 25	15
25 – 30	6
30 – 35	7
35 – 40	4
40 – 45	2
45 – 50	1

Calculate the median salary of the data.

30. In the given figure, the boundary of shaded region consists of four semicircular arcs, two smallest being equal. If diameter of the largest is 14 cm and that of the smallest is 3.5 cm, calculate the area of

the shaded region. $\left[\text{Use } \pi = \dfrac{22}{7} \right]$
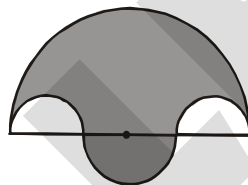
OR

In the given figure, ABC is a right triangle right angled at A. Find the area of shaded region if AB = 6 cm, BC = 10 cm and O is the centre of the incircle of ΔABC. [Take π = 3.14]
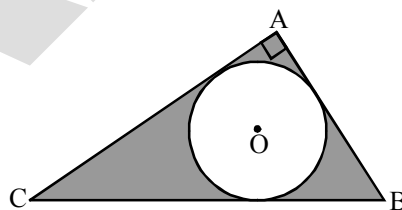
31. Represent the following pair of equations graphically and write the coordinates of points where the lines intersect y-axis : x + 3y = 6 ; 2x – 3y = 12.

OR

The sum of the numerator and the denominator of a fraction is 4 more than twice the numerator. If 3 is added to each of the numerator and denominator, their ratio becomes 2 : 3. Find the fraction.

32. Prove the following : (1 + cot A – cosec A) (1 + tan A + sec A) = 2

33. Prove that : $\dfrac{\sin A - 2\sin^3 A}{2\cos^3 A - \cos A} = \tan A$

34. In the given figure, AB is a chord of length 24 cm (see figure). The tangents at A and B intersect at point P. If the radius of circle is 13 cm. Find the length of PA.
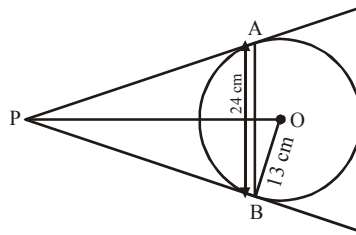
SECTION-D

35. Draw 'less than ogive' and 'more than ogive' for the following distribution and hence find its median.

| Class	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70	70 – 80	80 – 90
Frequency	8	12	24	6	10	15	25

36. Draw a pair of tangents to a circle of radius 5 cm which are inclined to each other at an angle of 60°.

OR

Construct an isosceles triangle whose base is 6 cm and altitude 4 cm. Then construct another triangle sides are $\dfrac{3}{4}$ times the corresponding sides of the isosceles triangle.

37. If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, prove that the other two sides are divided in the same ratio. Using the above, do the following :

In given figure, PQ ∥ AB and AQ ∥ CB. Prove that $AR^2 = PR.\ CR$.
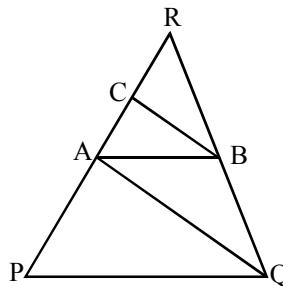
38. A train takes 2 hours less for a journey of 300 km if its speed is increased by 5 km/h from its usual speed. Find the usual speed of the train.

OR

Solve for x : $\dfrac{1}{(a+b+x)} = \dfrac{1}{a} + \dfrac{1}{b} + \dfrac{1}{x}$, [a ≠ 0, b ≠ 0, x ≠ –(a + b)].

39. The angle of elevation of a cloud from a point 60 m above the surface of the water of a lake is 30° and the angle of depression of its shadow from the same point in water of lake is 60°. Find the height of the cloud from the surface of water.

40. If the points A(1, – 2), B(2, 3), C(a, 2) and D(–4, –3) form a parallelogram. Find the value of a and height of the parallelogram taking AB as base.

OR

If A(–5, 7), B(–4, –5), C(–1, –6) and D(4, 5) are the vertices of a quadrilateral, find the area of the quadrilateral ABCD.