SHREE RADHEY COACHING CENTER

SPECIAL SAMPLE PAPER 1

Class 10 - Mathematics

Time Allowed: 3 hours   **Maximum Marks: 80**
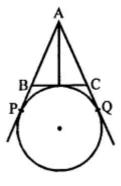
General Instructions:

1. This Question Paper has 5 Sections A-E.

2. Section A has 20 MCQs carrying 1 mark each

3. Section B has 5 questions carrying 02 marks each.

4. Section C has 6 questions carrying 03 marks each.

5. Section D has 4 questions carrying 05 marks each.

6. Section E has 3 case based integrated units of assessment (04 marks each) with subparts of the values of 1, 1 and 2 marks each respectively.

7. All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs of 3 marks and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2marks questions of Section E.

8. Draw neat figures wherever required. Take π =22/7 wherever required if not stated.

Section A

1. The point of intersection of the x-axis and y-axis is called   **[1]**

    a) ordinate   b) abscissa

    c) quardant   d) origin

2. In the given figure, AP, AQ and BC are tangents to the circle. If AB = 5 cm, AC = 6 cm and BC = 4 cm then the **[1]** length of AP is

    a) 7.5 cm   b) 15 cm

    c) 9 cm   d) 10 cm

3. A die is thrown once. The probability of getting a prime number is   **[1]**

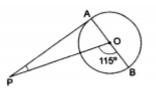   a) $\frac{1}{3}$ b) $\frac{1}{6}$

    c) $\frac{1}{2}$ d) $\frac{2}{3}$

4. The point where the medians of a triangle meet is called the _____ of the triangle **[1]**

   a) circumcentre　　　　　　　　　　　b) centroid

   c) orthocentre　　　　　　　　　　　d) None of these

5. The solution of 3x - 5y = -16 and 2x + 5y = 31 **[1]**

   a) x = -3, y = 5　　　　　　　　　　b) x = -3, y = -5

   c) x = 3, y = -5　　　　　　　　　　d) x = 3, y = 5

6. The point (-3, 5) lies in the _____ quadrant **[1]**

   a) 4th　　　　　　　　　　　　　　b) 2nd

   c) 3rd　　　　　　　　　　　　　　d) 1st

7. The probability of getting an even, number, when a die is thrown once is **[1]**

   a) $\frac{5}{6}$　　　　　　　　　　　　b) $\frac{1}{3}$

   c) $\frac{1}{2}$　　　　　　　　　　　　d) $\frac{1}{6}$

8. How many bricks each measuring (25 cm $\times$ 11.25 cm $\times$ 6 cm) will be required to construct a wall (8 m $\times$ 6 m $\times$ 22.5 cm)? **[1]**

   a) 7200　　　　　　　　　　　　　b) 4800

   c) 8000　　　　　　　　　　　　　d) 6400

9. If the probability of winning a game is 0.4 then the probability of losing it, is **[1]**

   a) None of these　　　　　　　　　b) 0.6

   c) 0.4　　　　　　　　　　　　　d) 0.96

10. The value of c for which the equation $ax^2 + 2bx + c = 0$ has equal roots is **[1]**

   a) $\frac{b^2}{4a}$　　　　　　　　　　　　b) $\frac{a^2}{4b}$

   c) $\frac{a^2}{b}$　　　　　　　　　　　　d) $\frac{b^2}{a}$

11. Which of the following has no real root? **[1]**

   a) $x^2 - 5x + 3\sqrt{2} = 0$　　　　　　b) $x^2 + 4x - 3\sqrt{2} = 0$

   c) $x^2 - 4x - 3\sqrt{2} = 0$　　　　　　d) $x^2 - 4x + 3\sqrt{2} = 0$

12. In a right triangle ABC, $\angle B = 90°$ and 2 AB = $\sqrt{3}$AC, then $\angle C$ is **[1]**

   a) $90°$　　　　　　　　　　　　　b) $60°$

   c) $75°$　　　　　　　　　　　　　d) $30°$

13. HCF of $(2^3 \times 3^2 \times 5)$, $(2^2 \times 3^3 \times 5^2)$ and $(2^4 \times 3 \times 5^3 \times 7)$ is **[1]**

   a) 60　　　　　　　　　　　　　　b) 48

   c) 30　　　　　　　　　　　　　　d) 105

14. The distance of the point P(-6, 8) from the origin is **[1]**

   a) $2\sqrt{7}$　　　　　　　　　　　　b) 6

   c) 8　　　　　　　　　　　　　　d) 10

15. In a right $\triangle ABC$, AC is the hypotenuse of length 10cm. If $\angle A = 30°$, then the area of the triangle is **[1]**

   a) $25\sqrt{3}cm^2$

   b) $25 cm^2$

   c) $\frac{25}{3}\sqrt{3}cm^2$

   d) $\frac{25}{2}\sqrt{3}cm^2$

16. The marks obtained by 9 students in Mathematics are 59, 46, 31, 23, 27, 40, 52, 35 and 29. The mean of the data is **[1]**

   a) 30

   b) 41

   c) 23

   d) 38

17. $\left(2 + \sqrt{2}\right)$ is **[1]**

   a) none of these

   b) an integer

   c) a rational number

   d) an irrational number

18. The value of 'k' for which the system of equations $3x + 5y = 0$ and $kx + 10y = 0$ has a non zero solution is **[1]**

   a) 0

   b) 8

   c) 2

   d) 6

19. **Assertion (A):** H.C.F. of smallest prime and smallest composite is 2. **[1]**

   Reason (R): Smallest prime is 2 and smallest composite is 4 so their H.C.F. is 2.

   a) Both A and R are true and R is the correct explanation of A.

   b) Both A and R are true but R is not the correct explanation of A.

   c) A is true but R is false.

   d) A is false but R is true.

20. **Assertion (A):** Two right-angled triangles are always similar. **[1]**

   Reason (R): By Pythagoras Theorem, $H^2 = P^2 + B^2$

   a) Both A and R are true and R is the correct explanation of A.

   b) Both A and R are true but R is not the correct explanation of A.

   c) A is true but R is false.

   d) A is false but R is true.

Section B

21. A box contains 90 discs which are numbered from 1 to 90. If one disc is drawn at random from the box, find the probability that it bears **[2]**

   i. a two-digit number

   ii. a perfect square number

   iii. a number divisible by 5.

22. Solve the pair of linear equations by substitution method: $7x - 15y = 2$ and $x + 2y = 3$ **[2]**

   OR

   On comparing the ratios $\frac{a_1}{a_2}, \frac{b_1}{b_2}$ and $\frac{c_1}{c_2}$, find out whether the following pair of linear equation is consistent, or inconsistent: $5x - 3y = 11$; $-10x + 6y = -22$

23. Find the zeroes of quadratic polynomial given as: $6x^2 - 3 - 7x$ and also verify the relationship between the zeroes and the coefficients. **[2]**

24. Find the coordinates of the point which divides the line segment joining the points (4, - 3) and (8, 5) in the ratio 3: 1 internally. **[2]**

25. Two concentric circles of radii a and b (a >b) are given. Find the length of the chord of the larger circle which **[2]**

touches the smaller circle.

OR

In the given figure, PA is a tangent from an external point P to a circle with centre O. If $\angle POB = 115°$, find $\angle APO$.
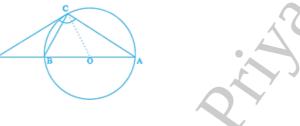

Section C

26. Write all the other trigonometric ratios of $\angle A$ in terms of sec A. **[3]**

27. Is the pair of linear equation consistent/ inconsistent? If consistent, obtain the solution graphically: x + y = 5, 2x + 2y = 10. **[3]**

28. There is a circular path around a sports field. Sonia takes 18 minutes to drive one round of the field, while Ravi takes 12 minutes for the same. Suppose they both start at the same point and at the same time, and go in the same direction. After how many minutes will they meet again at the starting point? **[3]**

OR

Define HCF of two positive integers and find the HCF of the pair of numbers: 475 and 495.

29. Diagonal AC and BD of a trapezium ABCD with $AB \| DC$ intersect each other at point O. Using a similarity criterion for two triangles, show that $\frac{OA}{OC} = \frac{OB}{OD}$. **[3]**

30. The tangent at a point C of a circle and a diameter AB when extended intersect at P. If $\angle PCA = 110^o$, find $\angle CBA$. **[3]**

[Hint: Join C with centre O].

OR

Prove that a diameter AB of a circle bisects all those chords which are parallel to the tangent at the point A.

31. A boy, flying a kite with a string of 90 m long, which is making an angle θ with the ground. Find the height of the kite. (Given $\tan \theta = \frac{15}{8}$) **[3]**

Section D

32. The length of the hypotenuse of a right-angled triangle exceeds the length of the base by 2 cm and exceeds twice the length of the altitude by 1 cm. Find the length of each side of the triangle. **[5]**
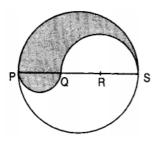
OR

The product of Tanay's age (in years) five years ago and his age ten years later is 16. Determine Tanay's present age.

33. In the given figure, if ∠A = ∠C, AB = 6cm, BP = 15 cm, AP = 12cm and CP = 4, then find the lengths of PD and CD. **[5]**

34. PQRS is a diameter of a circle of radius 6 cm. The lengths PQ, QR and RS are equal. Semi-circles are drawn on PQ and QS as diameters as shown in Fig. Find the perimeter and area of the shaded region **[5]**

<div align="center">OR</div>

A semicircular region and a square region have equal perimeters. The area of the square region exceeds that of the semicircular region by 4 cm^2. Find the perimeters and areas of the two regions.

35. The following table gives the distribution of the life time of 400 neon lamps: **[5]**
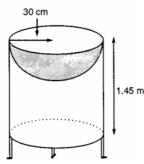
Lite time (in hours)	Number of lamps
1500-2000	14
2000-2500	56
2500-3000	60
3000-3500	86
3500-4000	74
4000-4500	62
4500-5000	48

Find the median life time of a lamp.

<div align="center">**Section E**</div>

36. **Read the text carefully and answer the questions:** **[4]**

Mayank a student of class 7th loves watching and playing with birds of different kinds. One day he had an idea in his mind to make a bird-bath on his garden. His brother who is studying in class 10th helped him to choose the material and shape of the birdbath. They made it in the shape of a cylinder with a hemispherical depression at one end as shown in the Figure below. They opted for the height of the hollow cylinder as 1.45 m and its radius is 30 cm. The cost of material used for making bird bath is ₹40 per square meter.

   (i) Find the curved surface area of the hemisphere.
   (ii) Find the total surface area of the bird-bath. (Take $\pi = \frac{22}{7}$)
   (iii) What is total cost for making the bird bath?

<div align="center">**OR**</div>

   Mayank and his brother thought of increasing the radius of hemisphere to 35 cm with same material so that birds get more space, then what is the new height of cylinder?

37. **Read the text carefully and answer the questions:** **[4]**

Sehaj Batra gets pocket money from his father every day. Out of pocket money, he saves money for poor people in his locality. On 1st day he saves ₹27.5 On each succeeding day he increases his saving by ₹2.5.

(i)   Find the amount saved by Sehaj on 10th day.

(ii)   Find the amount saved by Sehaj on 25th day.

(iii)   Find the total amount saved by Sehaj in 30 days.
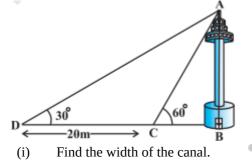
OR

Find in how many days Sehaj saves ₹1400.

38.   **Read the text carefully and answer the questions:**   **[4]**

A TV tower stands vertically on a bank of a canal. From a point on the other bank of a canal. From a point on the other bank directly opposite the tower, the angle of elevation of the top of the tower is 60° from a point 20 m away from this point on the same bank the angle of elevation of the top of the tower is 30°.

(i)   Find the width of the canal.

(ii)   Find the height of tower.

(iii)   Find the distance between top of the tower and point D.

OR

Find the distance between top of tower and point C.

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