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CLASS 10 MATH TEST PAPER 25

Class 10 - Mathematics

Time Allowed: 1 hour Maximum Marks: 30 Section A If 2 tan A = 3, then the value of $\frac{4 \sin A + 3 \cos A}{4 \sin A - 3 \cos A}$ is 1. [1] a) 3 b) does not exist d) $\frac{1}{\sqrt{13}}$ c) $\frac{7}{\sqrt{13}}$ The length of a minute hand of a wall clock is 7 cm. What is the area swept by it in 30 minutes is 2. [1] b) 63 cm² a) 35 cm^2 c) 50 cm^2 d) 77 cm² [1] The area of the sector of a circle of radius 10.5 cm is 69.3 cm². Find the central angle of the sector. 3. b) ₇₂0 a) 85° c) 70° d) 26° The radius and height of a right circular cone and that of a right circular cylinder are respectively equal. If the 4. [1] volume of the cylinder is 300 cu.cm, then the volume of the cone is b) 600 cu.cm a) 900 cu.cm d) 300 cu.cm c) 100 cu.cm 5. A solid sphere is cut into two hemispheres. The ratio of the surface areas of sphere to that of two hemispheres [1] taken together, is: a) 3:2 b) 1:1 c) 2:3 d) 1:4 If two trees of height 'x' and 'y' standing on the two ends of a road subtend angles of 30° and 60° respectively at [1] 6. the midpoint of the road, then the ratio of x : y is a) 1:3 b) 1:2 c) 3:1 d) 1:1 **Assertion (A):** The value of $\sin\theta = \frac{4}{3}$ is not possible. 7. [1] **Reason (R):** Hypotenuse is the largest side in any right-angled triangle. a) Both A and R are true and R is the correct b) Both A and R are true but R is not the explanation of A. correct explanation of A. c) A is true but R is false. d) A is false but R is true. **Assertion (A):** Area of a segment of a circle of radius r units and central angle $60^{\circ} = \frac{1}{2}r^2\left(\frac{\pi}{3} - \frac{\sqrt{3}}{2}\right)$ [1] 8. **Reason (R):** Area of a semicircle = $\frac{1}{2}\pi r^2$

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- 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

- 9. Prove that: $\frac{\cot^2 \theta(\sec \theta 1)}{1 + \sin \theta} = \sec^2 \theta \frac{(1 \sin \theta)}{(\sec \theta + 1)}.$
- 10. In figure, arcs have been drawn with radii 14 cm each and with centres P, Q and R. Find the area of the shaded [2] region.



Section C

- 11. Prove the trigonometric identity: $\frac{\cot^2 \theta(\sec \theta 1)}{(1 + \sin \theta)} + \frac{\sec^2 \theta(\sin \theta 1)}{(1 + \sec \theta)} = 0$
- 12. A round table cover has six equal designs, as shown in the figure. If the radius of the cover is 28 cm, find the [3] cost of making the designs at the rate of Rs. 0.35 per cm².[Use $\sqrt{3} = 1.7$.]



- 13. 30 circular plates, each of radius 14 cm and thickness 3cm are placed one above the another to form a cylindrical **[3]** solid. Find:
 - i. the total surface area
 - ii. volume of the cylinder so formed.

Section D

14. Read the following text carefully and answer the questions that follow:

[4]

[2]

[3]

An ice-cream seller used to sell different kinds and different shapes of ice-cream like rectangular shaped with one end hemispherical, cone-shaped and rectangular brick, etc. One day Sheetal and her brother came to his shop. Sheetal purchased an ice-cream which has the following shape: ice-cream cone as the union of a right circular cone and a hemisphere that has the same (circular) base as the cone. The height of the cone is 9 cm and the radius of its base is 2.5 cm. her brother purchased rectangular brick shaped ice cream with length 9 cm, width 4cm and thickness 2 cm.



- i. The volume of the ice-cream without a hemispherical end. (1)
- ii. The volume of the ice-cream with a hemispherical end. (1)

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iii. Find the volume her brother ice cream? (2)

OR

Whose quantity of ice cream is more and by how much? (2)

Section E

15. As observed from the top of a 75 m light house from the sea-level, the angles of depression of two ships are 30° [5] and 45°. If one ship is exactly behind the other on the same side of the light house, find the distance between the two ships. [Use $\sqrt{3} = 1.732$]

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