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PAPER 1
CLASS 10
CCE TERM 2 YEAR 2010

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 **10** questions of **1 mark** each, **Section – B** comprises of **8** questions of **2 marks** each, **Section – C** comprises of **10** questions of **3 marks** each and **Section – D** comprises of **6** questions of **4 marks** each.
3. Question numbers **1** to **10** 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. However, internal choice has been provided in **1** question of **two marks**, **3** questions of **three marks** each and **2** questions of **four marks** each. You must attempt only one of the alternatives in all such questions.
5. Use of calculator is **not** permitted.
6. An additional **15** minutes time has been allotted to read this question paper only.

Section – A

Question numbers 1 to 10 carry 1 mark each. For each question four choices are provided of which only one is correct. You have to select the correct choice.

1. For what value of k will $\frac{7}{3}$ be a root of $3x^2 - 13x - k = 0$.

a. 14 b. $\frac{3}{7}$ c. $\frac{-7}{2}$ d. -14

2. Which of the following is not an A.P.?

a. $13, 8, 3, -2, -7, -12$

b. $10.8, 11.2, 11.6, 12, 12.4$

c. $8\frac{1}{7}, 18\frac{2}{7}, 28\frac{3}{7}, 48\frac{4}{7}, 58\frac{5}{7}$

d. $8\frac{3}{23}, 11\frac{6}{23}, 14\frac{9}{23}, 17\frac{12}{23}$

3. If a pole of height 6 m casts a shadow $2\sqrt{3}$ m long on the ground, then the sun's elevation is

a. $30°$ b. $60°$ c. $45°$ d. $90°$

4. From a point P, which is at a distance of 13 cm from the centre O of a circle of radius 5 cm, the pair of tangents PQ and PR to the circle are drawn. What are the lengths (in cm) of the tangents PQ and PR?

a. 13, 12 b. 13, 13 c. 12, 12 d. 12, 18

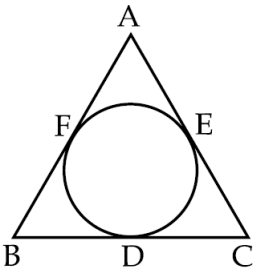
5. To draw a pair of tangents to a circle which are inclined to each other at an angle of $75°$, it is required to draw tangents at the end points of those two radii of the circle, the angle between them should be

a. $105°$ b. $65°$ c. $95°$ d. $75°$

6. The angle of elevation of the top of a tower from a point on the ground is $45°$. If the observer is 42 m away from the foot of the tower, the height of the tower is

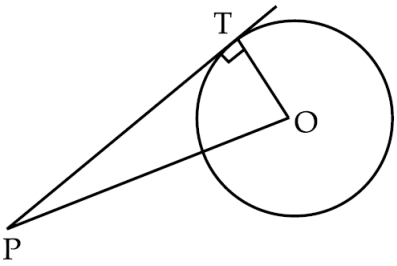
a. $63\ m$ b. $21\ m$ c. $84\ m$ d. $42\ m$

7. In the figure, if the semi – perimeter of ΔABC = 23 cm, then AF + BD + CE is



a. 46 cm b. 11.5 cm c. 23 cm d. 34.5 cm

8. In the given figure, PT is a tangent to the circle with centre O. If PT = 30 cm and the diameter of the circle is 32 cm, then the length of the line segment OP will be



a. 68 cm b. 34 cm c. 17 cm d. 34.8 cm

9. The circumference of a circle is 100 cm. The side of a square inscribed in the circle is

a. $50\sqrt{2}\ cm$ b. $\frac{100}{\pi}\ cm$ c. $\frac{50\sqrt{2}}{\pi}\ cm$ d. $\frac{100\sqrt{2}}{\pi}\ cm$

10. The volume of the largest right circular cone that can be cut out from a cube of edge 4.2 cm is

a. $9.7\ cm^3$ b. $77.6\ cm^3$ c. $58.2\ cm^3$ d. $19.4\ cm^3$

Section – B

Question numbers 11 to 18 carry two marks each.

11. Using quadratic formula, determine the roots of the following equation:
$x - \frac{1}{x} = 3.$

12. Find the sum of the first 23 terms of the A.P. $7, 10\frac{1}{2}, 14, \ldots\ldots$

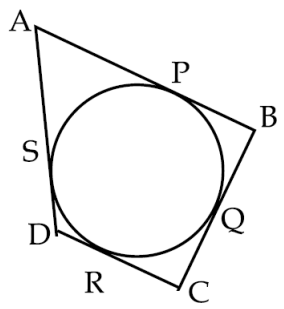
13. A ladder 15 m long just reaches the top of a vertical wall. If the ladder makes an angle of $60°$ with the wall, find the height of the wall.

14. The minute hand of a clock is $\sqrt{21}\ cm$ long. Find the area swept by the minute hand on the face of the clock from 7:00 a.m. to 7:05 a.m.

15. Prove that the tangents drawn at the end points of a diameter of a circle are parallel.

OR

In the given figure, a quadrilateral ABCD is drawn to circumscribe a circle. Prove that AB + CD = AD + BC.



16. Find the value of x, if the distance between the points $(x, -1)$ and $(3, -2)$ is $(x + 5)$.

17. If the point $C(-1, 2)$ divides internally the line segment joining $A(2, 5)$ and $B(x, y)$ in the ratio 3 : 4, then find the coordinates of point B.

18. The radii of the circular bases of a right circular cylinder and a cone are in the ratio of 3 : 4 and their heights are in the ratio 2 : 3. What is the ratio of their volumes?

Section – C

Question numbers 19 to 28 carry 3 marks each.

19. Solve the following quadratic equation: $x^2 - 3x - 10 = 0$.

OR

Solve the following equation using method of factorisation: $\frac{4}{x} - 3 = \frac{5}{2x+3}, x \neq 0, \frac{-3}{2}$

20. Determine the value of a so that $2a + 1, a^2 + a + 1$ and $3a^2 - 3a + 3$ are consecutive terms of an A.P.

21. Draw a pair of tangents to a circle of radius 3.5 cm which are perpendicular to each other.

22. Show that the points $(7, 3), (3, 0), (0, -4)$ and $(4, -1)$ are the vertices of a rhombus.

23. Find the area of ΔABC whose vertices are $A(4, 4), B(0, 0)$ and $C(6, 2)$.

24. A child has a die whose six faces show the letters as given below:

A	B	C	D	E	A

The die is thrown at random once. What is the probability of getting

(i) A

(ii) E.

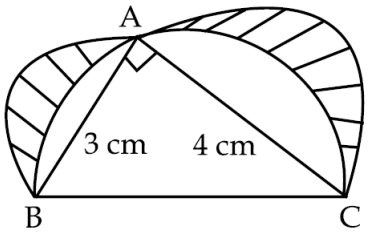
25. Three coins are tossed together. Find the probability of getting at least two heads.

26. A solid metallic sphere of diameter 21 cm is melted and recast into a number of smaller cones, each of diameter 7 cm and height 3 cm. Find the number of cones so formed.

27. A piece of wire has been bent in the form of a semicircle including the bounding diameter is straightened and then bent in the form of a square. Also find the difference between them.

OR

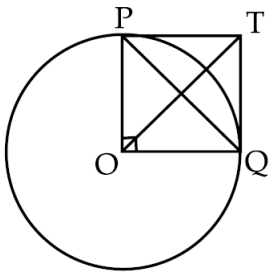
In the given figure, ABC is a triangle right angled at A. Semicircles are drawn on AB, AC and BC as diameters. Find the area of the shaded region.



28. Prove that the parallelogram circumscribing a circle is a rhombus.

OR

In the given figure, PO ⊥ QO. The tangents to the circle with centre O at P and Q intersect at a point T. Prove that PQ and OT are right bisectors of each other.



Section – D

Question numbers 29 to 34 carry four marks each.

29. Two pillars of equal heights are on either side of a road, which is 100 m wide. The angles of elevation of the top of the pillars are $60°$ and $30°$ at a point on the road between the pillars. Find the position of the point between the pillars on the road and the height of the pillars.

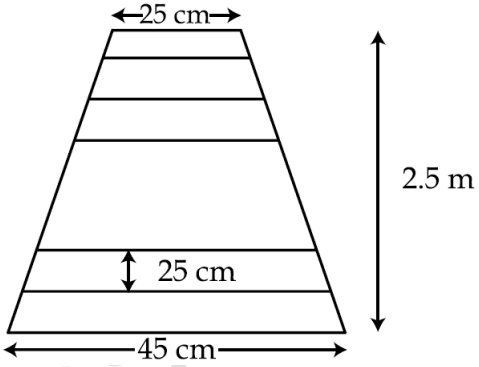
OR

From the top of a building 60 m high the angles of depression of the top and the bottom of a tower are observed to be $30°$ and $60°$ respectively. Find the height of the tower.

30. For what value of n, the n^{th} term of the A.P. $63, 65, 67, \ldots \ldots$ and $3, 10, 17, \ldots \ldots$ are equal? Also find that term.

OR

A ladder has rungs 25 cm apart. The rungs decrease uniformly in length from 45 cm at the bottom to 25 cm at the top as shown in the figure. If the top and bottom rungs are 2.5 m apart, what is the length of the wood required for the rungs?



31. A plane left 30 minutes later than the scheduled time and in order to reach its destination 1500 km away in time, it has to increase its speed by 250 km/h from its usual speed. Find its usual speed.

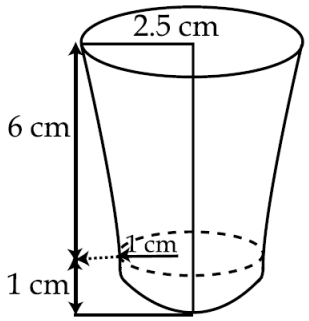
32. A building is in the form of a right circular cylinder surmounted by a hemispherical dome both having the same base radii. The base diameter of

the dome is equal to $\frac{2}{3}$ of the total height of the building. Find the height of the building, if it contains $67\frac{1}{21}\ m^3$ of air.

OR

A well whose diameter is 7 m has been dug 22.5 m deep and the earth dug out is used to form an embankment around it. If the height of the embankment is 1.5 m, find the height of the embankment.

33. A shuttle cock used for playing badminton has the shape of a frustum of a cone mounted on a hemisphere as shown in the figure. The diameter of the ends of the frustum are 5 cm and 2 cm, the height of the entire shuttle cock is 7 cm. Find the external surface area. $\left(Use\ \pi = \frac{22}{7}\right)$.



34. Prove that the tangents to a circle from an external point are equal.