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## Term Test 2022-23

Std: X MHB

Subject: Geometry

Marks: 40

Duration: 2 hrs

Topics Covered: Similarity, Pythagoras Theorem, Circles, Geometric Constructions, Co-ordinate Geometry, Trigonometry, Mensuration

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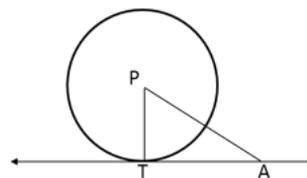
Note: (1) All questions are compulsory.  
(2) Use of a calculator is not allowed.

**Q. 1. (A) Solve the following questions: (Any four) (4 × 1 = 4)**

1. Length, breadth and height of a cuboid shape box of medicine is 20 cm, 12 cm and 10 cm. Find the total surface area of the cuboid.
2. In which quadrant or on which axis are the points given below?  
A(5,7), B(-6, 4)
3. The length of a hypotenuse of a right-angled triangle is 15. Find the length of the median of its hypotenuse.
4. Find the value of  $\frac{\cos 56^\circ}{\sin 34^\circ}$
5. Total surface area of a cube is 5400 sq. cm. Find the side of the cube.

**(B) Solve the following questions: (Any two) (2 × 2 = 4)**

1. Find the volume of a sphere whose surface area is 314 sq.cm. (Take  $\pi = 3.14$ )
2. In the figure, line TA is a tangent at the point T,  $\angle PAT = 30^\circ$  and PA = 7.8 cm. Find PT and TA.



3. In a right-angled triangle, the length of the perpendicular sides are 15 cm and 8 cm. Find the length of its hypotenuse.

**Q. 2. (A) Choose the correct alternatives:**

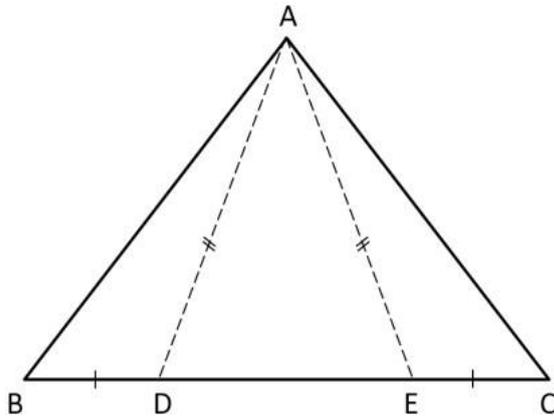
**(4 × 1 = 4)**

1. The curved surface area of a cylinder is  $900 \text{ cm}^2$ . If the circumference of the base and its height are equal, then the height of the cylinder is
- A. 30 cm
  - B. 20 cm
  - C. 90 cm
  - D. 60 cm
2. The value of  $\operatorname{cosec}^2(90^\circ - x) - \tan^2 x =$
- A. 1
  - B. -1
  - C.  $\cos x$
  - D.  $\sec x$
3. Tangent AB at point A of a circle of radius 5 cm meets a line through the centre O at point B such that  $OB = 12 \text{ cm}$ . Length AB is
- A. 5 cm
  - B. 12 cm
  - C. 13 cm
  - D.  $\sqrt{119} \text{ cm}$
4. Out of the given triplets, which is not a Pythagorean triplet?
- A. (104, 96, 40)
  - B. (52, 20, 48)
  - C. (32, 15, 30)
  - D. (61, 60, 11)

**(B) Solve the following questions: (Any two)**

**(2 × 2 = 4)**

1. In the figure, points D and E are on side BC of  $\triangle ABC$  such that  $BD = CE$  and  $AD = AE$ . Show that  $\triangle ABD \cong \triangle ACE$ .



2. Draw a circle of radius 5 cm, and take any point on the circle and draw a tangent passing through the point using the centre of the circle.
3.  $\triangle ABC \sim \triangle EDC$ .  $AC = 15$ ,  $BC = 10$ ,  $CE = 12$ . Find CD.

**Q. 3. (A) Complete the following activities: (Any two)**

**(2 × 2 = 4)**

1. Radius of a circle is 5 cm. The length of a chord of the circle is 8 cm. Find the distance of the chord from the centre.
2. Two circles having radii 5 cm and 4 cm touch each other. Find the distance between their centres.
3.  $\triangle ABC \sim \triangle PQR$ . If  $AB:PQ = 4:5$ , then find  $A(\triangle ABC):A(\triangle PQR)$ .

**(B) Solve the following questions: (Any two)**

**(2 × 2 = 4)**

1. If  $\tan x = \frac{40}{9}$ , then find  $\sec x$  and  $\cos x$ .

- If the segment DE with D (-2, 7) and E (-2, -5) is divided internally by point T in the ratio 1:3, then find the co-ordinates of point T.
- Draw a tangent at any point 'X' on the circle of radius 5 cm. (without using the centre)

**Q. 4. Solve the following questions: (Any three)**

**(3 × 3 = 9)**

- Prove that  $\tan x - \cot x = \frac{2\sin^2 x - 1}{\sin x \cdot \cos x}$
- Examine whether points (3, 3), (-4, -1) and (3, -5) are vertices of an isosceles triangle.
- Three circles touch each other pairwise externally. If the distance between their centres is 5 cm, 6 cm and 7 cm, find their radii.
- The side of a rhombus is 10 cm and one of the diagonals is 16 cm. Find the length of the other diagonal.

**Q. 5. Solve the following questions: (Any one)**

**(4 × 1 = 4)**

- The dimensions of a metallic cuboid are 44 cm × 42 cm × 21 cm. It is melted and recast into a sphere. Find the surface area of the sphere.
- $\Delta RKN \sim \Delta SKV$ . In  $\Delta RKN$ ,  $RK = 6.4$  cm,  $\angle R = 60^\circ$ ,  $\angle K = 50^\circ$  and  $RN/SV = 3/4$ . Construct  $\Delta RKN$  and  $\Delta SKV$ .

**Q. 6. Solve the following questions: (Any one)**

**(3 × 1 = 3)**

- If the area of a minor sector of a circle with radius 11.2 cm is  $49.28 \text{ cm}^2$ , then find the measure of the arc.
- Show that points A (-5, 4), B (-2, -2) and C (3, -12) are collinear using the distance formula.