DELHI PUBLIC SCHOOL, CHANDIGARH

Periodic Test - 3, Session 2024-25

Class: X, Subject: Maths (Set 1)

Time 1:30 hrs Aashita MM: 40

General Instructions:

The question paper is divided into 5 sections – A, B, C, D and E.

- Section A comprises of 8 questions of 1 mark each.
- Section B comprises of 3 questions of 2 marks each. Internal choice has been provided in 1 question.
- Section C comprises of 4 questions of 3 marks each. Internal choice has been provided in 2 questions.
- Section D comprises of 2 questions of 5 marks each. Internal choice has been provided in both the questions.
- Section E comprises of 1 question of 4 marks. It is case study-based question.

Section – A

1. The discriminant of the quadratic equation $2x^2 - 15x + 23 = 0$ is:

   (a) -56 (b) 41

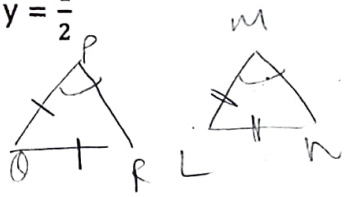
   (c) -41 (d) 56

2. If the coordinates of the mid-point of the line segment joining points A (2x, 5y) and B (4x, 3y) is (5, 2), then value of x and y are:

   (a) $x = \frac{-5}{2}, y = \frac{-1}{2}$ (b) $x = \frac{5}{3}, y = \frac{1}{2}$

   (c) $x = 6, y = 8$ (d) $x = \frac{-5}{3}, y = \frac{1}{2}$

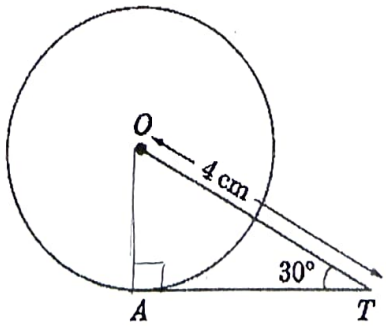
3. If in ΔPQR and ΔLMN, $\frac{PQ}{LM} = \frac{QR}{NL}$ and $\Delta PQR \sim \Delta MLN$, then

   (a) $\angle P = \angle N$ (b) $\angle P = \angle L$

   (c) $\angle Q = \angle L$ (d) $\angle Q = \angle M$

4. AT is a tangent to the circle with centre O such that OT = 4 cm and $\angle OTA = 30°$ The length of AT is:

   (a) $2\sqrt{3}$ cm (b) 4 cm

   (c) 2 cm (d) 5 cm

5. If the length of the arc of a circle is $\frac{7}{9}$ of the circumference of circle, then angle subtended by the arc at the centre of the circle is:

(a) 70°
(b) 280°
(c) 80°
(d) 100°

6. If $\theta = 30^0$, then $4\cos^3\theta - 3\cos\theta$ is:

(a) cos 30°
(b) cos 60°
(c) cos 90°
(d) cos 0°

7. The frequency of the median class is:

Age (in yrs)	0 - 10	10 - 20	20 - 30	30 - 40
No. of students	10	8	18	24

(a) 10
(b) 18
(c) 8
(d) 24

Assertion-Reasoning based MCQs:

Read the following statements carefully to mark the correct option out of the options given below.

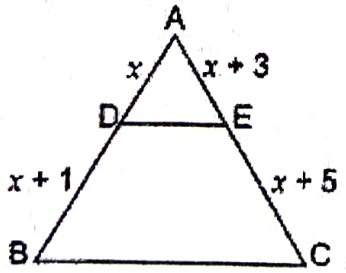
(a) Statement 1 is true, statement 2 is true; statement 2 is a correct explanation for statement 1.
(b) Statement 1 is true, statement 2 is true; statement 2 is not a correct explanation for statement 1.
(c) Statement 1 is true, statement 2 is false.
(d) Statement 1 is false, statement 2 is true.

8. **Assertion:** If 2 cubes each of volume 64 cm^3 are joined end to end, then the total surface area of the resulting cuboid is 160 cm^2.

Reasoning: Total surface area of a cuboid is 2(l + b) x h, where l= length, b = breadth and h = height.

Section – B

9. In ΔABC, DE || BC, find the value of x.



$\frac{x}{x+1} = \frac{x+3}{x+5}$

$x = 3$

10. Prove that the lengths of tangents drawn from an external point to a circle are equal.

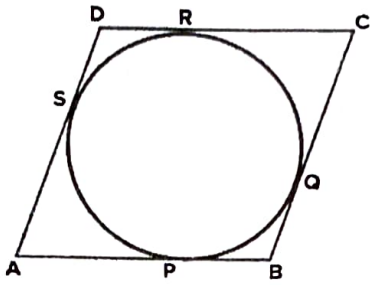
OR

Out of two concentric circles, the radius of the outer circle is 5 cm and the chord (of outer circle) of length 8 cm is tangent to the inner circle. Find the radius of the inner circle.

11. A chord of a circle of radius 10 cm subtends a right angle at the centre. Find the area of the corresponding minor segment. [Use π = 22/7]

Section – C

12. Prove that the parallelogram ABCD circumscribing the circle is a rhombus.



13. If the mean of the following frequency table is 50, find the missing frequency.

Classes	0 - 20	20 - 40	40 - 60	60 - 80	80 - 100
Frequency	17	a	32	24	19

OR

Find the median of the following distribution:

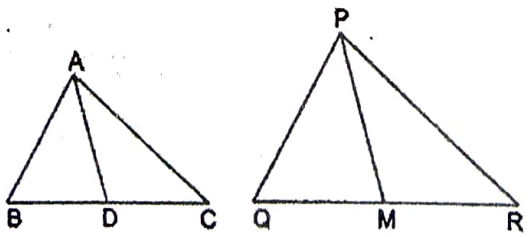
Class	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60	60 - 70
Frequency	4	4	8	10	12	8	4

14. A train travels a distance of 480 km at a uniform speed. If the speed had been 8 km/h less, then it would have taken 3 hours more to cover the same distance. Find the speed of the train.

15. Prove that if a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, then the other two sides are divided in the same ratio.

OR

Sides AB and BC and median AD of a triangle ABC are respectively proportional to sides PQ and QR and median PM of Δ PQR. Show that Δ ABC ~ Δ PQR.



Section – D

16. A toy is in the form of a cone mounted on a hemisphere of common base of radius 7 cm. The total height of the toy is 31 cm. Find the total surface area of the toy. [take π = 22/7]

OR

A solid is in the shape of a cone standing on a hemisphere with both their radii being equal to 7 cm and the height of the cone is equal to its diameter. Find the volume of the solid. [Use π = 22/7]

17. If cosec θ + cot θ = p, then prove that $cos\theta = \frac{p^2-1}{p^2+1}$

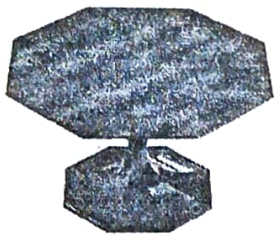
OR

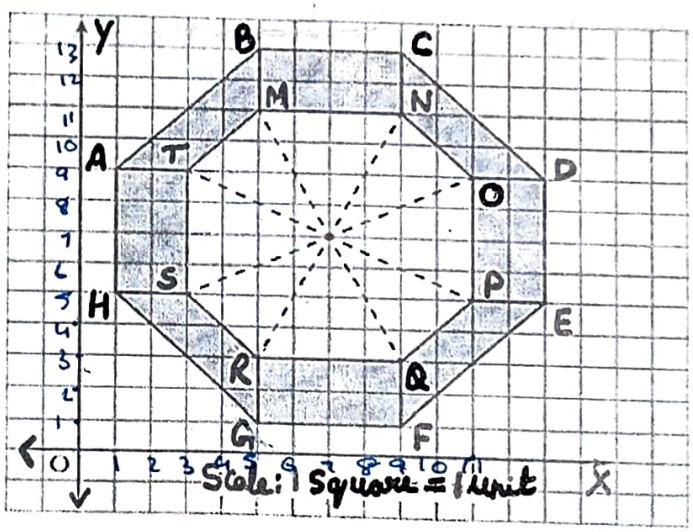
Solve: $\frac{4cot^2 60° + sec^2 30° - 2sin^2 45°}{sin^2 60° + cos^2 45°}$

Section – E

18. **Read the text carefully and answer the following questions**

The top of a table is shown on the graph given below:





a) Write the coordinates of point P and M. (1)

b) Find the coordinates of mid points of line segment joining points R and N. (1)

c) Find the distance between points S and C. (2)