



ANANDALAYA
PERIODIC TEST – 3
Class: X

Subject: Mathematics (041)

Date :23-12-2024

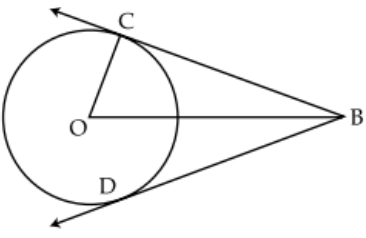
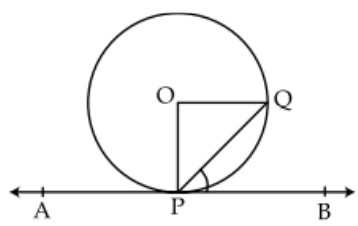
M.M: 40

Time: 1Hr 30 min

General Instructions:

1. The question paper consists of 21 questions divided into 4 sections A, B, C and D.
2. All questions are compulsory.
3. Section A comprises of 9 questions of 1 mark each.
4. Section B comprises of 6 questions of 2 marks each. Internal choice has been provided in two questions.
5. Section C comprises of 5 questions of 3 marks each. Internal choice has been provided in two questions.
6. Section D has 1 source based/case based/passage based/integrated units of assessment of 4 marks. An internal choice has been provided in the 2 marks questions.
7. Draw neat figures wherever required. Take $\pi = 22/7$ wherever required if not stated.

SECTION – A

1. Calculate the perimeter (in cm) of a square circumscribing a circle of radius p cm. (1)
(A) $8p$ (B) $4p$ (C) $2p$ (D) $4\sqrt{p}$
2. A cone, a hemisphere and a cylinder stand on equal bases and have equal height. What is the ratio of their volumes? (1)
(A) $1 : 2 : 3$ (B) $2 : 3 : 4$ (C) $1 : 3 : 4$ (D) $2 : 3 : 5$
3. In Fig. if $OC = 9\text{cm}$, and $OB = 15\text{cm}$, then find $BC + BD$. (1)
(A) 18 cm (B) 12 cm
(C) 24 cm (D) 36 cm 
4. The angle of elevation of the top of a tower from a point on the ground, which is 20m away from the foot of the tower is 60° . Find the height of the tower. (1)
(A) $10\sqrt{3}\text{ m}$ (B) $30\sqrt{3}\text{ m}$ (C) $20\sqrt{3}\text{ m}$ (D) 10m
5. What is the volume in cu cm of a cube whose surface area is 1944 sq cm ? (1)
(A) 1728 (B) 4096 (C) 2744 (D) 5832
6. APB is a tangent to a circle with centre O , at point P . If $\angle QPB = 50^\circ$, then find the measure of $\angle POQ$. (1)
(A) 100° (B) 120°
(C) 140° (D) 80° 
7. An arc of a circle is of length $5\pi\text{ cm}$ and the sector it bounds has an area of $20\pi\text{ cm}^2$. Find the radius of the circle. (1)
(A) 4 cm (B) 10 cm (C) 8 cm (D) 15 cm
8. A 1.5m tall boy stands at a distance of 3m from lamp post and casts a shadow of 4.5m on the ground. Find the height of the lamp post. (1)
(A) 3m (B) 2.5m (C) 5m (D) 3.5m

In the following Q.9, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

- (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.

9. (A): Total surface area of the cylinder having radius of the base 14 cm and height 30 cm is 3872cm^2 . (1)

(R): If r be the radius and h be the height of the cylinder, then total surface area = $(2\pi rh + 2\pi r^2)$.

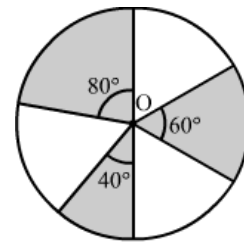
SECTION – B

10. A rectangular sheet of paper 40 cm x 22 cm, is rolled to form a hollow cylinder of height 40 cm. (2)
 Find the diameter of the cylinder (in cm).

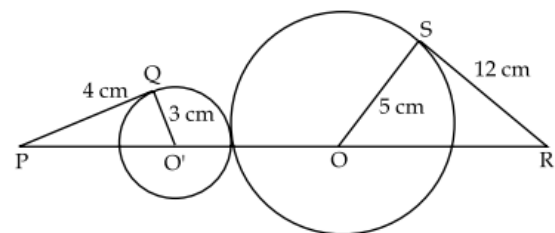
OR

Find the volume of the largest right circular cone that can be cut out of a cube whose edge is 21 cm.

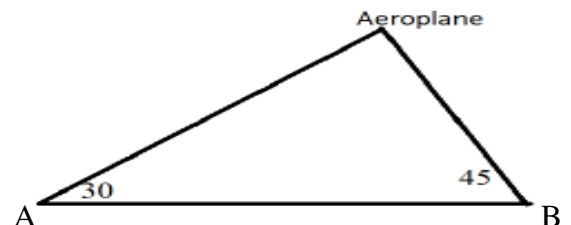
11. In figure, three sectors of a circle of radius 7 cm, making angles of 60° , 80° , 40° at the centre are shaded. What is the area of the shaded region (in cm^2). (2)



12. For the given figure find the length of PR. (2)



13. Stations A and B are $3(1+\sqrt{3})$ km apart. Each station sights an aeroplane at an angle of 30° and 45° as shown in figure. Find the altitude of the aeroplane. (2)



14. Prove that the lengths of tangents drawn from an external point to a circle are equal. (2)

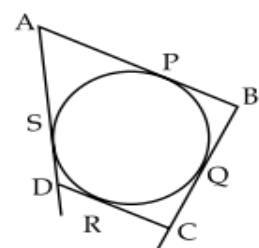
OR

ABC is an isosceles triangle, in which $AB = AC$, circumscribed about a circle. Show that BC is bisected at the point of contact.

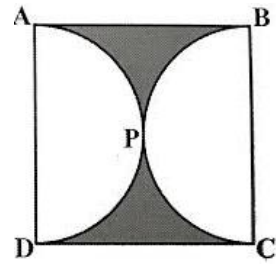
15. The radii of two circles are 8 cm and 6 cm respectively. Find the radius of the circle having area equal to the sum of the areas of the two circles. (2)

SECTION – C

16. In the given figure; quadrilateral ABCD is drawn to circumscribe a circle. Prove that $AD + BC = AB + CD$. (3)



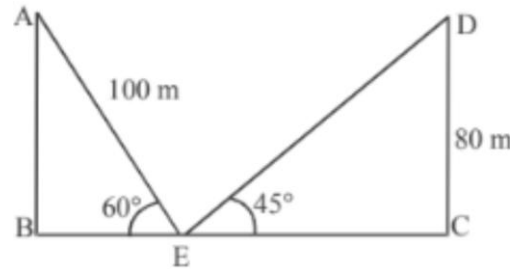
17. Find the perimeter of the shaded region in figure, if $ABCD$ is a square of side 14 cm and APD and BPC are semicircles. (3)



OR

The area of sector of a circle is $(5/8)^{\text{th}}$ area of a circle, then find the central angle of the sector.

18. In the figure, find the value of BC . (3)



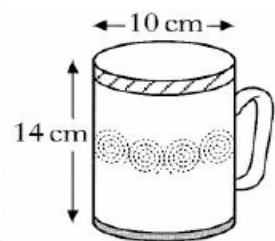
19. The radius and slant height of a right circular cone are in the ratio of $7 : 13$ and its curved surface area is 286 cm^2 . Find its radius. (3)
20. The shadow of a tower standing on a level ground is found to be 40 m longer when the Sun's altitude is 30° than when it is 60° . Find the height of the tower. (3)

OR

The angle of elevation of the top of a building from the foot of a tower is 30° and the angle of elevation of the top of the tower from the foot of the building is 60° . If the tower is 50 m high, find the height of the building.

SECTION D

21. During Covid times people prefer using homogenized milk, AMUL Processed and aseptically packed in an exceptional six-layer, tamper-proof Tetra Packaging with 0% bacteria and 100% pure health. This new six layer interfere proof, prevents air and freshness, light and bacteria from entering the pack. As an effect, the milk stays fresh and pure for a minimum of 180 days until opened, even without refrigeration. The 500 ml milk is packed in cuboidal containers of dimensions $15 \times 8 \times 5$. These milk packets are then packed in cuboidal cartons of dimension $30 \times 32 \times 15$. (All dimensions are in cm). Based on the above given information answer the following questions



- (i) How many milk packets can be filled in a carton? (1)
- (ii) How much milk will the cup contain? (see the figure given) (1)
- (iii) How much cardboard is needed to make the carton if 10% of wastage is taken into account. (2)

OR

- (iii) Find the total surface area of a Tetra Pack.