



HANSRAJ PUBLIC SCHOOL
SECTOR-6, PANCHKULA
Class- X, PERIODIC TEST- III (2022-23)
SUBJECT-MATHEMATICS

Date- 07-11-2022

Time: 1.5 hours

Roll No. _____

Maximum Marks: 40

General Instructions:

1. This Question Paper has 5 Sections A-E.
2. Section A has 9 MCQs carrying 1 mark each
3. Section B has 2 questions carrying 02 marks each.
4. Section C has 3 questions carrying 03 marks each.
5. Section D has 2 questions carrying 05 marks each.
6. Section E has 2 case based integrated units of assessment (04 marks each) with sub-parts of the values of 1, 1 and 2 marks each respectively.
7. Draw neat figures wherever required. Take $\pi = 22/7$ wherever required if not stated.

SECTION A

Q.1. The angle of depression of a car parked on the road from the top of a 150 m high tower is 30° . The distance of the car from the tower (in metres) is

- (a) $50\sqrt{3}$ (b) $150\sqrt{3}$
(c) $150\sqrt{2}$ (d) 75

Q.2. The circumference of a circle is 22 cm. The area of its quadrant (in cm^2) is

- (a) $77/2$ (b) $77/4$
(c) $77/8$ (d) $77/16$

Q.3. If the perimeter of one face of a cube is 20 cm, then its surface area is

- (a) 120 cm^2 (b) 150 cm^2
(c) 125 cm^2 (d) 400 cm^2

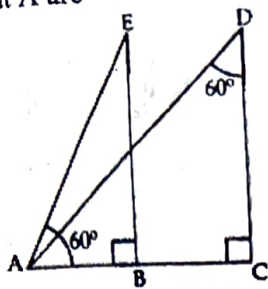
Q.4. The area of the circle that can be inscribed in a square of 12 cm is

- (a) $36\pi \text{ cm}^2$ (b) $18\pi \text{ cm}^2$
(c) $12\pi \text{ cm}^2$ (d) $9\pi \text{ cm}^2$

Q.5. The total surface area of a hemispherical solid having radius 7 cm is

- (a) 462 cm^2 (b) 294 cm^2
(c) 588 cm^2 (d) 154 cm^2

Q.6. In given Fig., the angle of depression from the observing position D and E of the object at A are



- (a) $60^\circ, 60^\circ$
 (c) $30^\circ, 60^\circ$

- (b) $30^\circ, 30^\circ$
 (d) $60^\circ, 30^\circ$

Q.7. A portion of a 60 m long tree is broken by tornado and the top struck up the ground making an angle of 30° with the ground level. The height of the point where the tree is broken is equal to

- (a) 30 m
 (c) 40 m

- (b) 35 m
 (d) 20 m

DIRECTION: In the question number 4 and 5, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct option

Q.8. **Assertion:** In a circle of radius 6 cm, the angle of a sector 60° . Then the area of the sector is $18\frac{6}{7} \text{ cm}^2$.

Reason: Area of the circle with radius r is πr^2 .

- (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A)
 (b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A)
 (c) Assertion (A) is true but reason (R) is false.
 (d) Assertion (A) is false but reason (R) is true.

Q.9. **Assertion:** Total surface area of the cylinder having radius of the base 14 cm and height 30 cm is 3872 cm^2 .

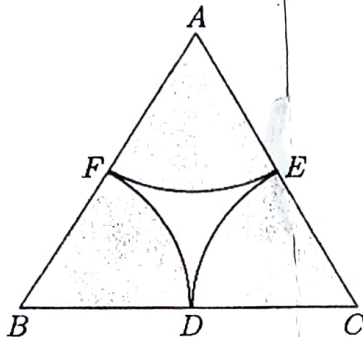
Reason: If r be the radius and h be the height of the cylinder, then total surface area = $(2\pi rh + 2\pi r^2)$.

- (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A)
 (b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A)
 (c) Assertion (A) is true but reason (R) is false.
 (d) Assertion (A) is false but reason (R) is true.

SECTION B

Q.10. From the top of light house, 40 m above the water, the angle of depression of a small boat is 60° . Find how far the boat is from the base of the light house.

Q.11. In given figure arcs are drawn by taking vertices A, B and C of an equilateral triangle of side 10 cm, to intersect the side BC, CA and AB at their respective mid-points D, E and F. Find the area of the shaded region. (Use $\pi = 3.14$)



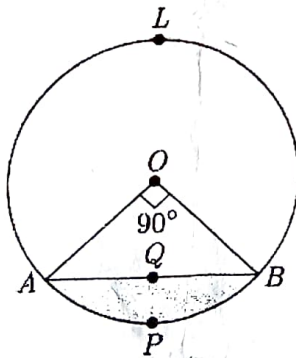
Handwritten calculations for Q.11:

$$\frac{314}{25} \times 5 \times 5 = 314$$

$$\frac{31400}{100}$$

SECTION C

Q.12. In the given figure, a chord AB of the circle with centre O and radius 10 cm, that subtends a right angle at the centre of the circle. Find the area of the minor segment AQB. Hence find the area of major segment ALBQA. (Use $\pi = 3.14$)



Q.13. A hollow cylindrical pipe is made up of copper. It is 2.1 m long. The outer and inner diameters of the pipe are 10 cm and 6 cm respectively. Find the volume of copper used in making the pipe. Also find external curved surface area.

Q.14. The angle of elevation of the top of a tower from a point A on the ground is 30° . On moving a distance of 20 metre towards the foot of the tower to a point B the angle of elevation increase to 60° . Find the height of the tower and the distance of the tower from the point A.

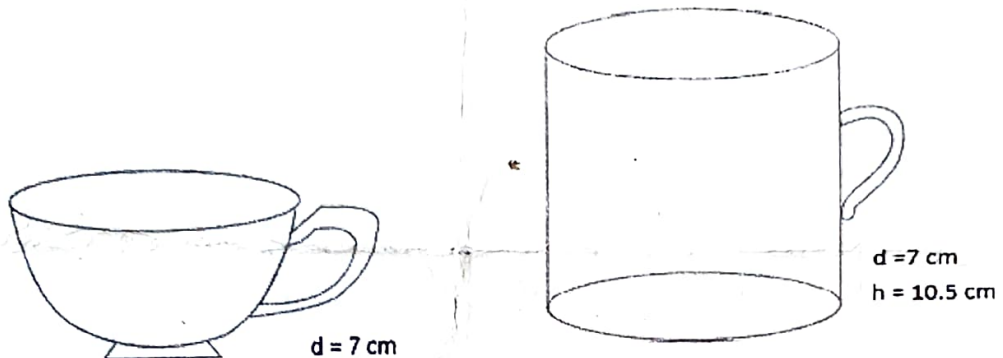
SECTION D

Q.15. Two poles of equal heights are standing opposite to each other on either side of a road, which is 120 m wide. From a point between them on the road, angles of elevation of their top are 30° and 60° . Find the height of the poles and distance of point from poles.

Q.16. A decorative block, made up of two solids - a cube and a hemisphere. The base of the block is a cube of side 6 cm and the hemisphere fixed on the top has a diameter of 3.5 cm. Find the total surface area of the block.

SECTION E

Q.17. Adventure camps are the perfect place for the children to practice decision making for themselves without parents and teachers guiding their every move. Some students of a school reached for adventure at Sakleshpur. At the camp, the waiters served some students with a welcome drink in a cylindrical glass and some students in a hemispherical cup whose dimensions are shown below. After that they went for a jungle trek. The jungle trek was enjoyable but tiring. As dusk fell, it was time to take shelter. Each group of four students was given a canvas to make a conical tent to accommodate all the four students. the students put the tents. The radius of the tent is 7 m.



Use the above figure to answer the questions that follow:

- (i) What is volume of hemispherical cup? (2)
- (ii) How much space on the ground is occupied by each student in the conical tent? (1)
- (iii) Find out the slant height of tent if its vertical height is 5m. (1)

Q.18. Pendulum Clock : It is a clock that uses a pendulum, a swinging weight, as its timekeeping element. From its invention in 1656 by Christiaan Huygens, the pendulum clock was the world's most precise timekeeper, accounting for its widespread use. Their greater accuracy allowed for the faster pace of life which was necessary for the Industrial Revolution. The home pendulum clock was replaced by less-expensive, synchronous, electric clocks in the 1930s and 40s. Pendulum clocks are now kept mostly for their decorative and antique value. Priya bought a pendulum clock for her living room. the clock contains a small pendulum of length 45 cm. the minute hand and hour hand of the clock are 9 cm and 6 cm long respectively.

- (i) Find the area swept by the minute hand in 14 minutes. (2)
- (ii) Find the angle described by minute hand in 10 minutes. (1)
- (iii) Find the distance covered by the tip of minute hand in 14 minutes. (1)