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PRACTICE PAPER 1 (2023-24)
CHAPTER 9 MENSURATION (ANSWERS)

SUBJECT: MATHEMATICS **MAX. MARKS : 40**
CLASS : VIII **DURATION : $1\frac{1}{2}$ hr**

SECTION – A

Questions 1 to 6 carry 1 mark each.

1. A cube of side 4 cm is cut into 1 cm cubes. What is the ratio of the surface areas of the original cubes and cut-out cubes?
(a) 1 : 2 (b) 1 : 3 (c) 1 : 4 (d) 1 : 6
Ans: (c) 1: 4
Given: The cube side is 4cm
The side of cube 4cm is cut into small cubes, in which each of 1 cm
Therefore, the total number of cubes = 4 x 16 = 64 cubes
Thus, the number of cut-out cubes = 64/1
Now, the surface area of the cut-out cubes = c x 1 cm^2
The surface area of the original cube = 6 x 4^2
Hence, the required ratio obtained = 6 x 4^2 / = 64 x 6 = 1: 4

2. What will be the change in the volume of a cube when its side becomes ten times the original side?
(a) Volume becomes 1000 times. (b) Volume becomes 10 times.
(c) Volume becomes 100 times. (d) Volume becomes 1 / 1000 times
Ans: (a) Volume becomes 1000 times.
Consider the side of the cube is x, then its volume = x^3.
Given that if the side becomes ten times the original side, then the new volume is
Volume = $(10x)^3 = 1000x^3$

3. If the height of a cylinder becomes 1/4 of the original height and the radius is doubled, then which of the following will be true?
(a) Curved surface area of the cylinder will be doubled.
(b) Curved surface area of the cylinder will remain unchanged.
(c) Curved surface area of the cylinder will be halved.
(d) Curved surface area will be 1/4 of the original curved surface.
Ans: (c) Curved surface area of the cylinder will be halved.
We know that the curved surface area of a cylinder with radius "r" and height "h" is given as
The curved surface area of a cylinder = $2\pi rh$ … (1)
Now, the new curved surface area of the cylinder with radius 2r and height (1/4)h, then the new curved surface area = $2\pi(2r)(1/4)h = \pi rh$
Now, multiply and divide the new curved surface area by 2, we will get
= $(1/2)(2)\pi rh$ …. (2)
Now, by comparing (1) and (2), we get:
The new curved surface area of a cylinder is (1/2) times of the original curved surface area of a cylinder.

4. The dimensions of a godown are 40 m, 25 m and 10 m. If it is filled with cuboidal boxes, each of dimensions 2 m × 1.25 m × 1 m, then the number of boxes will be
(a) 1800 (b) 2000 (c) 4000 (d) 8000

Ans: (c) 4000
Given that, the dimensions of the godown are 40 m, 25 m and 10 m
Volume = 40 m × 25 m × 10 m = 10000 m^3
Given that the volume of each cuboidal box is 2 m × 1.25 m × 1 m = 2.5 m^3
Hence, the total number of boxes to be filled in the godown = 10000/2.5 = 4000

5. How many small cubes with edges of 20 cm each can be just accommodated in a cubical box of 2 m edge?
(a) 10 (b) 100 (c) 1000 (d) 10000
Ans: (c) 1000
We know that the volume of a cube is $(side)^3$
Therefore, the volume of each small cube is $(20)^3$ = 8000 cm^3
When it is converted into m^3, we get V = 0.008 m^3
It is given that the volume of the cuboidal box is 2^3 = 8 m^3
Now, the number of small cubes that can be accommodated in the cuboidal box is
= 8/ 0.008 = 1000

6. The area of a parallelogram is 60 $cm^{2,}$ and one of its altitudes is 5 cm. The length of its corresponding side is
(a) 12 cm (b) 6 cm (c) 4 cm (d) 2 cm
Ans: (a) 12 cm
The area of a parallelogram = base x altitude
⇒ b. h = A ⇒ b (5) = 60 ⇒ b = 60/5 ⇒ b = 12cm

SECTION – B(CCT Questions)

Questions 7 to 10 carry 1 mark each.

CCT Question

Savitri had to make a model of a cylindrical kaleidoscope for her science project. She wanted to use chart paper to make the curved surface of the kaleidoscope. (see the below figure). She wanted to make a kaleidoscope of length 25 cm with a 7cm diameter? You may take π = 22/7

Answer the following questions based on the above information:

7. Find the radius of the kaleidoscope.
(a) 7 cm (b) 14 cm (c) 3.5 cm (d) none of these
Ans: (c) 3.5 cm
Diameter = 7 cm ⇒ radius, r = 7/2 = 3.5cm

8. Find the area of chart paper required.
(a) 616 cm^2 (b) 500 cm^2 (c) 550 cm^2 (d) 536 cm^2
Ans: (b) 500 cm^2
Area of chart paper required = CSA of cylinder
= 2πrh = 2 × 22/7 × 3.5 × 25

$= 550\ cm^2$

9. Find the cost of chart paper if the rate of chart paper is Rs. 2 per $100cm^2$.
(a) Rs. 110 (b) Rs. 11 (c) Rs. 22 (d) none of these
Ans: (b) Rs. 11
Cost of $100\ cm^2$ = Rs. 2
∴ Total cost of chart paper = Rs. $2 \times \frac{1}{100} \times 550$ = Rs. 11

10. Find the volume of the kaleidoscope.
(a) $962.5\ cm^3$ (b) $960.5\ cm^3$ (c) $1078\ cm^3$ (d) none of these
Ans: (a) $962.5\ cm^3$
Volume of the kaleidoscope
$= \pi r^2 h = 22/7 \times 3.5 \times 3.5 \times 25$
$= 962.5\ cm^3$

SECTION – C

Questions 11 to 13 carry 2 marks each.

11. From a circular sheet of radius 4 cm, a circle of radius 3 cm is cut out. Calculate the area of the remaining sheet after the smaller circle is removed.
Ans: The area of the remaining sheet after the smaller circle is removed will be = Area of the entire circle with radius 4 cm – Area of the circle with radius 3 cm
We know, Area of circle = πr^2
So, Area of the entire circle = $\pi(4)^2 = 16\pi\ cm^2$
And, Area of the circle with radius 3 cm which is cut out = $\pi(3)^2 = 9\pi\ cm^2$
Thus, the remaining area = $16\pi - 9\pi = 7\pi\ cm^2$

12. A matchbox measures 4 cm×2.5cm×1.5cm. What will be the volume of a packet containing 12 such boxes?
Ans: Dimensions of a matchbox (a cuboid) are l × b × h = 4 cm × 2.5 cm × 1.5 cm, respectively
Formula to find the volume of matchbox = l × b × h = (4 × 2.5 × 1.5) = 15
Volume of matchbox = $15\ cm^3$
Now, volume of 12 such matchboxes = $(15\times12)\ cm^3 = 180\ cm^3$
Therefore, the volume of 12 matchboxes is $180\ cm^3$.

13. A small indoor greenhouse (herbarium) is made entirely of glass panes (including the base) held together with tape. It is 30cm long, 25 cm wide, and 25 cm high. What is the area of the glass?
Ans: Length of the greenhouse, say l = 30cm
Breadth of the greenhouse, say b = 25 cm
Height of greenhouse, say h = 25 cm
(i) Total surface area of greenhouse = Area of the glass = 2[lb + lh + bh]
= [2(30×25 + 30×25 + 25×25)] = [2(750 + 750 + 625)] = (2 × 2125) = 4250
The total surface area of the glass is $4250\ cm^2$

SECTION – D

Questions 14 to 17 carry 3 marks each.

14. If the lateral surface of a cylinder is $94.2cm^2$ and its height is 5cm, then find (i) radius of its base (ii) its volume.[Use π= 3.14]

Ans: CSA of cylinder = 94.2 cm^2
Height of cylinder, h = 5cm
(i) Let the radius of the cylinder be r.
Using the CSA of the cylinder, we get $2\pi rh = 94.2$
$\Rightarrow 2 \times 3.14 \times r \times 5 = 94.2 \Rightarrow r = 3$
(ii) Volume of cylinder = $\pi r^2 h$
Now, $\pi r^2 h = (3.14 \times (3)^2 \times 5) = 141.3$ cm^3

15. A cuboidal box of dimensions 1 m × 2 m × 1.5 m is to be painted except its bottom. Calculate how much area of the box has to be painted.
Ans: Given, Length of the box, l = 2 m,
Breadth of box, b = 1 m
Height of box, h = 1.5 m
We know that the surface area of a cuboid = 2(lb + lh + bh)
But here the bottom part is not to be painted.
So, Surface area of box to be painted = lb + 2(bh + hl)
$= 2 \times 1 + 2 (1 \times 1.5 + 1.5 \times 2) = 2 + 2 (1.5 + 3.0) = 2 + 9.0 = 11$
Hence, the required surface area of the cuboidal box = 11 m^2

16. The floor of a building consists of 3000 tiles which are rhombus shaped and each of its diagonals are 45 cm and 30 cm in length. Find the total cost of polishing the floor, if the cost per $m^2$is Rs. 4.
Ans: Length of one diagonal, d_1 = 45 cm and d_2= 30 cm
∵ Area of one tile = $(½)d_1d_2 = (½)\times45\times30 = 675$
Area of one tile is 675 cm^2
Area of 3000 tiles = 675×3000 = 2025000 cm^2 = 2025000/10000
= 202.50 m^2 [∵ $1m^2$ = 10000 cm^2]
∵ Cost of polishing the floor per sq. meter = 4
Cost of polishing the floor per 202.50 sq. meter = 4×202.50 = 810
Hence the total cost of polishing the floor is Rs. 810.

17. The curved surface area of a right circular cylinder of height 14 cm is 88 cm^2. Find the diameter of the base of the cylinder (Assume π =22/7).
Ans: Height of cylinder, h = 14cm
Let the diameter of the cylinder be d.
The curved surface area of cylinder = 88 cm^2
We know that the formula to find the Curved surface area of the cylinder is $2\pi rh$.
So $2\pi rh$ =88 cm^2 (r is the radius of the base of the cylinder)
$\Rightarrow 2\times(22/7)\times r\times14 = 88$ cm^2 $\Rightarrow 2r = 2$ cm $\Rightarrow d = 2$ cm
Therefore, the diameter of the base of the cylinder is 2 cm.

SECTION – E

Questions 18 to 20 carry 4 marks each.

18. A suitcase with measures 80 cm x 48 cm x 24 cm is to be covered with a tarpaulin cloth. How many meters of tarpaulin of width 96 cm is required to cover 100 such suitcases?
Ans: Length of suitcase box, l = 80 cm,
Breadth of suitcase box, b= 48 cm
And Height of cuboidal box , h = 24 cm
Total surface area of suitcase box = 2(lb + bh + hl) = 2(80×48+48×24+24×80)
= 2 (3840+1152+1920) = 2×6912 = 13824

Total surface area of suitcase box is 13824 cm^2
Area of Tarpaulin cloth = Surface area of suitcase
$\Rightarrow l \times b = 13824 \Rightarrow l \times 96 = 13824 \Rightarrow l = 144$
Required tarpaulin for 100 suitcases = 144×100 = 14400 cm = 144 m
Hence tarpaulin cloth required to cover 100 suitcases is 144 m.

19. The circumference of the base of the cylindrical vessel is 132cm, and its height is 25cm. How many litres of water can it hold? (Assume $\pi = 22/7$)
Ans: Circumference of the base of cylindrical vessel = 132 cm
Height of vessel, h = 25 cm
Let r be the radius of the cylindrical vessel.
We know that the circumference of the base = $2\pi r$, so $2\pi r = 132$ (given)
$\Rightarrow r = (132/(2\pi)) \Rightarrow r = 66\times7/22 = 21$
Now, Volume of cylindrical vessel = $\pi r^2 h = (22/7)\times21^2\times25 = 34650$
Therefore, the volume is 34650 cm^3
Since 1000 cm^3 = 1L
So, Volume = 34650/1000 L= 34.65L

20. A village, having a population of 4000, requires 150 litres of water per head per day. It has a tank measuring 20 m×15 m×6 m. For how many days will the water in this tank last?
Ans: Length of the tank = l = 20 m, Breadth of the tank = b = 15 m
Height of the tank = h = 6 m and Total population of a village = 4000
Consumption of water per head per day = 150 litres
Water consumed by the people in 1 day = (4000×150) litres = 600000 litres …(1)
Formula to find the capacity of the tank, $V = l \times b \times h$
Using the given data, we have V = (20×15×6) m^3= 1800 m^3
$\Rightarrow$ V = 1800000 litres
Let water in this tank last for d days.
Water consumed by all people in d days = Capacity of the tank (using equation (1))
$\Rightarrow 600000\,d = 1800000 \Rightarrow d = 3$
Therefore, the water in this tank will last for 3 days.