Surface Areas and Volumes

Standard difficulty · 20 questions · 40 marks · Time: 42 minutes

Name: _____ Date: _____ Score: ____ / 40

Show your working for Sections B and C. Answers are on the last page — try every question first!

Section A — Choose the correct answer — 8 × 1 = 8 marks

1. A solid is a cylinder of radius 7 cm and height 15 cm with a hemisphere of the same radius on top. Its volume (π = 22/7) is:

(a) 3,747 1/3 cm^3 **(b)** 2,310 cm^3 **(c)** 3,050 2/3 cm^3 **(d)** 3,028 2/3 cm^3

2. A paperweight is a cone of radius 105 cm and slant height 111 cm mounted on a hemisphere of the same radius. Its total surface area (π = 22/7) is:

(a) 140,580 cm^2 **(b)** 36,630 cm^2 **(c)** 105,930 cm^2 **(d)** 175,230 cm^2

3. A solid is a cube of edge 28 cm with a hemisphere of diameter 28 cm fixed on top. Its surface area (π = 22/7) is:

(a) 6,320 cm^2 **(b)** 4,704 cm^2 **(c)** 5,320 cm^2 **(d)** 5,936 cm^2

4. A capsule is a cylinder 36 mm long with a hemisphere of radius 7 mm at each end. Its surface area (π = 22/7) is:

(a) 1,892 mm^2 **(b)** 1,584 mm^2 **(c)** 2,200 mm^2 **(d)** 2,508 mm^2

5. The curved surface area of a cylinder of radius r and height h is:

(a) $2\pi rh$ **(b)** πrh **(c)** πr^2h **(d)** $2\pi r(r + h)$

6. A solid is a cylinder of radius 14 cm and height 33 cm with a cone of the same radius and height 22 cm on top. Its volume (π = 22/7) is:

(a) 25,845 1/3 cm^3 **(b)** 33,880 cm^3 **(c)** 20,328 cm^3 **(d)** 24,845 1/3 cm^3

7. A cone of the same base and height is carved out of a solid cylinder of radius 7 cm and height 23 cm. The volume left (π = 22/7) is:

(a) 2,361 1/3 cm^3 **(b)** 3,361 1/3 cm^3 **(c)** 1,180 2/3 cm^3 **(d)** 3,542 cm^3

8. Assertion (A): A toy made of a cone (radius 21 cm, slant height 29 cm) on a hemisphere of the same radius has a surface area of 4,686 cm^2 (π = 22/7).
Reason (R): The surface area of a combined solid is the sum of the total surface areas of its parts.

(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.

Section B — Short answer — 8 × 2 = 16 marks

9. A tent is a cylinder of radius 7 m and height 14 m with a cone of the same radius and slant height 25 m on top. Find the area of canvas used (π = 22/7).

10. An ice-cream cone is a cone of radius 42 mm and height 56 mm, filled with ice-cream and topped with a hemisphere of the same radius. Find the volume of ice-cream (π = 22/7).

11. A capsule is a cylinder 32 mm long with a hemisphere of radius 14 mm at each end. Find its volume (π = 22/7).

12. A buoy is a cone standing on a hemisphere, both of radius 14 cm, and the height of the cone equals its radius. Find its volume (π = 22/7).

13. A hemispherical hollow of radius 7 cm is scooped out of the top of a solid wooden block 33 cm × 32 cm × 15 cm. Find the volume of wood left (π = 22/7).

14. A container is a cylinder of radius 7 cm and height 23 cm, but its bottom is a raised hemisphere of the same radius. Find how much it seems to hold and how much it really holds (π = 22/7).

15. A bird bath is a cylinder of radius 42 cm and height 140 cm with a hemispherical bowl of the same radius at the top. Find its total surface area, outside of the cylinder and inside of the bowl (π = 22/7).

16. A solid is a cylinder of radius 14 cm and height 35 cm with a cone of the same radius and slant height 50 cm on top. Find its total surface area (π = 22/7).

Section C — Word problems — 4 × 4 = 16 marks

17. A circus tent is a cylinder of radius 35 m and height 7 m with a cone of slant height 37 m on top. Find the cost of the canvas at Rs 63 per m^2 (π = 22/7).

18. A toy is a cone of radius 42 mm and height 144 mm on a hemisphere of the same radius. A cylinder is drawn around it, touching it. Find the difference between the volume of the cylinder and the toy (π = 22/7).

19. A storage tank is a cylinder of radius 7 m and height 12 m with a hemispherical bottom of the same radius. How much can it hold (π = 22/7)?

20. A solid iron pole is a cylinder of radius 14 cm and height 110 cm with a cylinder of radius 7 cm and height 80 cm on top. Iron has a mass of 8 g per cm^3. Find the mass of the pole (π = 22/7).

Want another sheet on this chapter? In the Ambiful Worksheets app every sheet is new, with its answer key, and your child never gets the same question twice.
Scan the code to get the free app, or open **worksheets.ambiful.com/get**

Answer key

Surface Areas and Volumes · AW-10M-SAV-2026-V1 · For parents — fold back or tear off before handing the sheet to your child.

Q	Answer	Working
1	**(d) 3,028 2/3 cm^3**	$\pi r^2 h + (2/3)\pi r^3$ = 2,310 + 718 2/3
2	**(c) 105,930 cm^2**	$\pi r l + 2\pi r^2$ = 36,630 + 69,300
3	**(c) 5,320 cm^2**	$6a^2 - \pi r^2 + 2\pi r^2 = 6a^2 + \pi r^2$ = 4,704 + 616
4	**(c) 2,200 mm^2**	$2\pi r h + 4\pi r^2$ = 1,584 + 616
5	**(a) $2\pi r h$**	—
6	**(d) 24,845 1/3 cm^3**	$\pi r^2 h_1 + (1/3)\pi r^2 h_2$ = 20,328 + 4,517 1/3
7	**(a) 2,361 1/3 cm^3**	$\pi r^2 h - (1/3)\pi r^2 h = (2/3)\pi r^2 h$
8	**(c) A is true, but R is false.**	A is true: $\pi r l + 2\pi r^2$ = 4,686. R is false.
9	**1,166 m^2**	$2\pi r h + \pi r l$ = 616 + 550
10	**258,720 mm^3**	$(1/3)\pi r^2 h + (2/3)\pi r^3$ = 103,488 + 155,232
11	**31,210 2/3 mm^3**	$\pi r^2 h + (4/3)\pi r^3$ = 19,712 + 11,498 2/3
12	**8,624 cm^3**	$(1/3)\pi r^3 + (2/3)\pi r^3 = \pi r^3 = 22/7 \times 14^3$
13	**15,121 1/3 cm^3**	$15{,}840 - (2/3) \times 22/7 \times 7^3$ = 15,840 − 718 2/3
14	**seems 3,542 cm^3; really 2,823 1/3 cm^3**	apparent $\pi r^2 h$; actual $\pi r^2 h - (2/3)\pi r^3$
15	**48,048 cm^2**	$2\pi r h + 2\pi r^2$ = 36,960 + 11,088
16	**5,896 cm^2**	base $\pi r^2 + 2\pi r h + \pi r l$
17	**Rs 353,430**	canvas = $2\pi r h + \pi r l$ = 5,610 m^2
18	**609,840 mm^3**	cylinder 1,031,184 (height 186); toy 421,344
19	**2,566 2/3 m^3**	$\pi r^2 h + (2/3)\pi r^3$ = 1,848 + 718 2/3
20	**640.64 kg**	volume = 80,080 cm^3; mass = 80,080 × 8 g

Ambiful Worksheets · worksheets.ambiful.com · Not affiliated with CBSE / NCERT