

MATHEMATICS

CLASS 10

Topic : VOLUMES OF SOLIDS

Worksheet -2

Special Topic Worksheet: Volumes of Combination of Solids (50 MCQs with Answer Key)

Q1. The volume of a cube of edge 'a' is:

- (a) $6a^2$ (b) a^3
(c) $4a^3$ (d) $3a^2$

Q2. The volume of a cuboid of length l, breadth b and height h is:

- (a) $2(lb + bh + hl)$ (b) lbh
(c) $l + b + h$ (d) $2h(l + b)$

Q3. The volume of a cylinder of base radius r and height h is:

- (a) $2\pi rh$ (b) $\pi r^2 h$
(c) $\frac{1}{3} \pi r^2 h$ (d) $2\pi r^2 h$

Q4. The volume of a cone of base radius r and height h is:

- (a) $\pi r^2 h$ (b) $\frac{1}{3} \pi r^2 h$
(c) $\frac{2}{3} \pi r^2 h$ (d) $3\pi r^2 h$

Q5. The volume of a sphere of radius r is:

- (a) $\frac{4}{3} \pi r^3$ (b) $\frac{2}{3} \pi r^3$
(c) $4\pi r^2$ (d) $\frac{1}{3} \pi r^3$

Q6. The volume of a solid hemisphere of radius r is:

- (a) $\frac{4}{3} \pi r^3$ (b) $\frac{2}{3} \pi r^3$
(c) $\frac{1}{3} \pi r^3$ (d) $\frac{3}{4} \pi r^3$

Q7. If the edge of a cube is 4 cm, its volume is:

- (a) 16 cm^3 (b) 64 cm^3
(c) 96 cm^3 (d) 32 cm^3

Q8. If two cubes each of volume 27 cm^3 are joined end to end, the volume of the resulting cuboid is:

- (a) 27 cm^3 (b) 54 cm^3
(c) 108 cm^3 (d) 81 cm^3

Q9. A solid is in the shape of a cone standing on a hemisphere with both their radii being equal to 1 cm and height of cone equal to its radius. Volume of solid in terms of π is:

- (a) $\pi \text{ cm}^3$ (b) $2\pi \text{ cm}^3$
(c) $3\pi \text{ cm}^3$ (d) $\frac{1}{2} \pi \text{ cm}^3$

Q10. A gulab jamun contains sugar syrup up to about 30% of its volume. If total volume of 45 gulab jamuns is 1125 cm^3 , volume of syrup is approx:

- (a) 338 cm^3 (b) 375 cm^3
(c) 300 cm^3 (d) 450 cm^3

Q11. A pen stand made of wood is in the shape of a cuboid with four conical depressions. The volume of wood in the entire stand is equal to:

- (a) Volume of cuboid - $4 \times$ Volume of cone
(b) Volume of cuboid + $4 \times$ Volume of cone
(c) $4 \times$ Volume of cone
(d) Volume of cuboid - Volume of cone

Q12. A solid iron pole consists of a cylinder of height 220 cm and base diameter 24 cm, surmounted by another cylinder of height 60 cm and radius 8 cm. Total volume is equal to:

- (a) Sum of volumes of both cylinders
(b) Difference of volumes of both cylinders
(c) Volume of larger cylinder only
(d) Volume of smaller cylinder only

Q13. A spherical glass vessel has a cylindrical neck 8 cm long, 2 cm in diameter; the diameter of the spherical part is 8.5 cm. Total volume is:

- (a) Volume of sphere + Volume of cylinder
(b) Volume of sphere - Volume of cylinder
(c) Volume of sphere only
(d) $2 \times$ Volume of cylinder

Q14. If the radius of a sphere is doubled, its volume becomes:

- (a) 2 times (b) 4 times
(c) 8 times (d) 16 times

Q15. If the radius of a sphere is tripled, its volume becomes:

- (a) 3 times (b) 9 times
(c) 27 times (d) 81 times

Q16. If the radius of a sphere is halved, its volume becomes:

- (a) $1/2$ of original (b) $1/4$ of original
(c) $1/8$ of original (d) $1/16$ of original

Q17. Ratio of the volume of a cylinder to the volume of a cone of same base radius and same height is:

- (a) 1 : 3 (b) 3 : 1
(c) 1 : 1 (d) 2 : 3

Q18. Ratio of the volume of a sphere to the volume of a hemisphere of same radius is:

- (a) 2 : 1 (b) 1 : 2
(c) 4 : 1 (d) 3 : 2

Q19. If a cone, a hemisphere and a cylinder stand on equal bases and have the same height, the ratio of their volumes is:

- (a) 1 : 2 : 3 (b) 2 : 1 : 3
(c) 3 : 2 : 1 (d) 1 : 3 : 2

Q20. The volume of the largest right circular cone that can be cut out from a cube of edge 'a' is:

- (a) $1/12 \pi a^3$ (b) $1/4 \pi a^3$
(c) $1/3 \pi a^3$ (d) $1/6 \pi a^3$

Q21. The volume of the largest sphere that can be carved out of a cube of side 7 cm is:

- (a) 179.67 cm^3 (b) 381.70 cm^3
(c) 539 cm^3 (d) 250 cm^3

Q22. A solid metallic sphere of radius 3 cm is melted and recast into a solid cone of height 9 cm. The radius of base of cone is:

- (a) 2 cm (b) 3 cm
(c) 4 cm (d) 6 cm

Q23. If the height of a cylinder is equal to its diameter, then its volume in terms of radius r is:

- (a) πr^3 (b) $2\pi r^3$
(c) $3\pi r^3$ (d) $4\pi r^3$

Q24. Volume of a hollow cylinder of outer radius R , inner radius r and height h is:

- (a) $\pi h(R^2 - r^2)$ (b) $\pi h(R - r)^2$
(c) $2\pi h(R + r)$ (d) $\pi h(R^2 + r^2)$

Q25. Volume of a hollow sphere of outer radius R and inner radius r is:

- (a) $\frac{4}{3} \pi(R^3 - r^3)$ (b) $\frac{4}{3} \pi(R - r)^3$
(c) $\frac{4}{3} \pi(R^2 - r^2)$ (d) $\frac{2}{3} \pi(R^3 - r^3)$

Q26. Volume of a hollow hemisphere of outer radius R and inner radius r is:

- (a) $\frac{2}{3} \pi(R^3 - r^3)$ (b) $\frac{2}{3} \pi(R - r)^3$
(c) $\frac{4}{3} \pi(R^3 - r^3)$ (d) $\frac{1}{3} \pi(R^3 - r^3)$

Q27. If radius of a cylinder is doubled and height is halved, its volume becomes:

- (a) Same (b) Doubled
(c) Halved (d) Quadrupled

Q28. If height of a cylinder is doubled and radius is halved, its volume becomes:

- (a) Same (b) Doubled
(c) Halved (d) One-fourth

Q29. If the volumes of two spheres are in ratio $64 : 27$, the ratio of their radii is:

- (a) $4 : 3$ (b) $16 : 9$
(c) $8 : 3$ (d) $2 : 1$

Q30. If the volumes of two cubes are in ratio $8 : 27$, the ratio of their surface areas is:

- (a) $2 : 3$ (b) $4 : 9$
(c) $8 : 27$ (d) $16 : 81$

Q31. If radius of a cone is 6 cm and height is 7 cm, its volume is ($\pi = \frac{22}{7}$):

- (a) 264 cm^3 (b) 132 cm^3
(c) 528 cm^3 (d) 792 cm^3

Q32. Volume of a sphere of diameter 6 cm is:

- (a) $36\pi \text{ cm}^3$ (b) $288\pi \text{ cm}^3$
(c) $144\pi \text{ cm}^3$ (d) $18\pi \text{ cm}^3$

Q33. Volume of a hemisphere of radius 3 cm is:

- (a) $18\pi \text{ cm}^3$ (b) $36\pi \text{ cm}^3$
(c) $9\pi \text{ cm}^3$ (d) $54\pi \text{ cm}^3$

Q34. A cylindrical tank of radius 7 m and height 10 m is full of water. Its capacity in liters is ($1 \text{ m}^3 = 1000 \text{ L}$):

- (a) 1540 L (b) 154000 L
(c) 1540000 L (d) 15400 L

Q35. Volume of a cone of height 12 cm and slant height 13 cm is:

- (a) $100\pi \text{ cm}^3$ (b) $300\pi \text{ cm}^3$
(c) $60\pi \text{ cm}^3$ (d) $120\pi \text{ cm}^3$

Q36. If the base area of a cylinder is 154 cm^2 and height is 10 cm, its volume is:

- (a) 1540 cm^3 (b) 770 cm^3
(c) 3080 cm^3 (d) 154 cm^3

Q37. If base area of a cone is 38.5 cm^2 and height is 6 cm, its volume is:

- (a) 77 cm^3 (b) 231 cm^3
(c) 154 cm^3 (d) 115.5 cm^3

Q38. A cubical vessel is 10 m long and 8 m wide. How high must it be made to hold 480 cubic meters of liquid?

- (a) 6 m (b) 5 m
(c) 4 m (d) 8 m

Q39. Find the volume of a sphere whose surface area is 154 cm^2 (take $\pi = 22/7$):

- (a) 179.67 cm^3 (b) 539 cm^3
(c) 359.33 cm^3 (d) 269.5 cm^3

Q40. If curved surface area of a sphere is 616 cm^2 , its volume is approx:

- (a) 1437.33 cm^3 (b) 616 cm^3
(c) 1232 cm^3 (d) 2874.67 cm^3

Q41. A solid cone of radius r and height h is melted to form a solid cylinder of radius r. Height of cylinder is:

- (a) $h/3$ (b) $3h$
(c) h (d) $h/2$

Q42. Three metallic spheres of radii 6 cm, 8 cm and 10 cm are melted to form a single solid sphere. Radius of new sphere is:

- (a) 12 cm (b) 14 cm
(c) 16 cm (d) 24 cm

Q43. The number of solid spheres of radius 1 cm that can be made from a solid sphere of radius 8 cm is:

- (a) 512 (b) 64
(c) 256 (d) 128

Q44. How many spherical lead shots each 3 cm in diameter can be made from a solid cuboid of dimensions 9 cm $\times$ 11 cm $\times$ 12 cm?

- (a) 84 (b) 42
(c) 21 (d) 168

Q45. A copper rod of diameter 1 cm and length 8 cm is drawn into a wire of length 18 m of uniform thickness. The radius of wire is:

- (a) $1/30$ cm (b) $1/15$ cm
(c) $1/45$ cm (d) $1/60$ cm

Q46. A hemispherical tank full of water is emptied by a pipe at the rate of 3.42 liters per second. The volume of hemisphere of radius 1.5 m is:

- (a) 7.07 m^3 (b) 14.14 m^3
(c) 3.53 m^3 (d) 10.6 m^3

Q47. Ratio of volume of cube of side 'a' to the volume of sphere of radius 'a' is:

- (a) $3 : 4\pi$ (b) $4\pi : 3$
(c) $6 : \pi$ (d) $\pi : 6$

Q48. Volume of solid generated by revolving a rectangle of dimensions 4 cm $\times$ 3 cm about its longer side as axis is:

- (a) $36\pi \text{ cm}^3$ (b) $48\pi \text{ cm}^3$
(c) $12\pi \text{ cm}^3$ (d) $24\pi \text{ cm}^3$

Q49. Volume of solid generated by revolving a right angled triangle with sides 3 cm, 4 cm and 5 cm about side 4 cm is:

(a) $12\pi \text{ cm}^3$

(b) $16\pi \text{ cm}^3$

(c) $20\pi \text{ cm}^3$

(d) $15\pi \text{ cm}^3$

Q50. Two solid hemispheres of radius r are joined along their flat bases. The volume of the resulting solid is:

(a) $\frac{4}{3} \pi r^3$

(b) $\frac{2}{3} \pi r^3$

(c) $\frac{8}{3} \pi r^3$

(d) $2\pi r^3$

ANSWER KEY & SOLUTIONS GUIDE

Q.No - Ans	Q.No - Ans	Q.No - Ans	Q.No - Ans	Q.No - Ans
Q1: (b) a^3	Q11: (a) Volume of cuboid - $4 \times$ Volume of cone	Q21: (a) 179.67 cm^3	Q31: (a) 264 cm^3	Q41: (a) $h/3$
Q2: (b) lbh	Q12: (a) Sum of volumes of both cylinders	Q22: (b) 3 cm	Q32: (a) $36\pi \text{ cm}^3$	Q42: (a) 12 cm
Q3: (b) $\pi r^2 h$	Q13: (a) Volume of sphere + Volume of cylinder	Q23: (b) $2\pi r^3$	Q33: (a) $18\pi \text{ cm}^3$	Q43: (a) 512
Q4: (b) $1/3 \pi r^2 h$	Q14: (c) 8 times	Q24: (a) $\pi h(R^2 - r^2)$	Q34: (c) 1540000 L	Q44: (a) 84
Q5: (a) $4/3 \pi r^3$	Q15: (c) 27 times	Q25: (a) $4/3 \pi (R^3 - r^3)$	Q35: (a) $100\pi \text{ cm}^3$	Q45: (a) $1/30 \text{ cm}$
Q6: (b) $2/3 \pi r^3$	Q16: (c) $1/8$ of original	Q26: (a) $2/3 \pi (R^3 - r^3)$	Q36: (a) 1540 cm^3	Q46: (a) 7.07 m^3
Q7: (b) 64 cm^3	Q17: (b) 3 : 1	Q27: (b) Doubled	Q37: (a) 77 cm^3	Q47: (a) 3 : 4π
Q8: (b) 54 cm^3	Q18: (a) 2 : 1	Q28: (c) Halved	Q38: (a) 6 m	Q48: (a) $36\pi \text{ cm}^3$
Q9: (a) $\pi \text{ cm}^3$	Q19: (a) 1 : 2 : 3	Q29: (a) 4 : 3	Q39: (a) 179.67 cm^3	Q49: (a) $12\pi \text{ cm}^3$
Q10: (a) 338 cm^3	Q20: (a) $1/12 \pi a^3$	Q30: (b) 4 : 9	Q40: (a) 1437.33 cm^3	Q50: (a) $4/3 \pi r^3$