

Quiz Date: 29th February 2020

Q1. The radius of a circle is 75% of that of a sphere. The volume of the sphere is $2304\pi m^3$. If ratio between area of a rectangle and that of the circle is 7: 18, then what is the perimeter of the rectangle. Length of rectangle is 2 m more than breadth.

- (a) 40 m
- (b) 52 m
- (c) 48 m
- (d) 70 m
- (e) 30 m

Q2. Length, breadth and height of a room are 12 m, 9 m and 8 m respectively. There are two windows and one gate. The dimensions of the windows are $150 \times 80 cm^2$ and $200 \times 160 cm^2$ respectively while dimensions of gate is $350 \times 100 cm^2$. If total cost of painting the walls of room is Rs. 9843, then find the cost of paint per m^2 .

- (a) Rs. 25 per m^2
- (b) Rs. 40 per m^2
- (c) Rs. 30 per m^2
- (d) Rs. 28 per m^2
- (e) Rs. 35 per m^2

Q3. Ratio between total surface area of right circular cylinder and total surface area of sphere is 11:7. Volume of sphere is $\frac{4312}{3} cm^3$. Find the volume of cone which radius and height is same as that of cylinder. Radius of cylinder and sphere is also same.

- (a) $1078 cm^3$
- (b) $770 cm^3$
- (c) $878 cm^3$
- (d) $616 cm^3$
- (e) $913 cm^3$

Q4. Area of a rectangular garden is $4200 m^2$. If length and breadth of the garden is decreased by 10 m, the area is decreased by $1200 m^2$. What is the length of wire for fencing the garden?

- (a) 130 m
- (b) 210 m
- (c) 240 m
- (d) 320 m
- (e) 260 m

Q5. Difference between perimeter of two rectangles is 8 cm. If breadth of both rectangles is 22 cm and length of first triangle is $14\frac{2}{7}\%$ less than second triangle, then find the volume of cone whose radius is half of the length of larger rectangle and height equal to length of smaller rectangle?

- (a) $4456 cm^3$
- (b) $3954 cm^3$
- (c) $4562 cm^3$

- (d) 4928 cm^3
 (e) 3843 cm^3

Q6. There are four light poles in four corners of a square park, four at midpoint of each side and one pole in the middle of that square park. Area of park is 19600 cm^2 . If side of park is 50 times of radius of each light pole, then find the total base area covered by these poles if pole's base is circular in shape? (all poles in the square park)

- (a) 197.12 cm^2
 (b) 172.48 cm^2
 (c) 246.4 cm^2
 (d) 220.76 cm^2
 (e) 221.76 cm^2

Q7. Total surface area of a cylinder mounted with a hemispherical bowl on one end is 2552 cm^2 . If height of cylinder is 8 cm then find the volume of the solid body? (cm^3)

- (a) $10443\frac{1}{3}$
 (b) $10677\frac{1}{3}$
 (c) $10547\frac{1}{3}$
 (d) $10977\frac{1}{3}$
 (e) $10787\frac{1}{3}$

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Q8. A rectangular tank is 22-meter-long and 25 meter deep. If 2772 cubic meter of water be drawn off the tank, the level of the water in the tank goes down by 7 meters. Find the breadth and total capacity of tank.

- (a) 18 m, 9900 m^3
 (b) 21 m, 9100 m^3
 (c) 15 m, 9900 m^3
 (d) 24 m, 8800 m^3
 (e) 18m, 9600 m^3

Q9. There is a rectangular field of dimension $30 \text{ m} \times 21 \text{ m}$. A pit of 10.5 m breadth, 15 m length and 18 m deep is dug from the corner of the field. The removed mud from the pit spread over the remaining field. Find the rise in the height of the field due to this operation.

- (a) 2 m
- (b) 10 m
- (c) 4 m
- (d) 8 m
- (e) 6 m

Q10. A spherical metal ball of radius 12 cm is melted into number of solid cylinder and cone. The radius of cone is same as that of the cylinder while height of cylinder twice of radius of cone. If height of cone is 3 cm which is 75% of height of cylinder, then find the sum of all such number of cone and cylinder. Number of cylinders are twice of no. of cones.

- (a) 64
- (b) 32
- (c) 128
- (d) 192
- (e) 144

Q11. A rectangular classroom has to be painted covering all its surfaces excluding floor. The cost of painting a similar room is Rs 1872. But its length, breadth and height are 10% less, 10% more and 10% less than the dimensions of the classroom respectively. How much will it cost to paint the classroom if its length, breadth and height are in the ratio of 1 : 2 : 3?

- (a) Rs 1,956
- (b) Rs 2,000
- (c) Rs 2,100
- (d) Cannot be determined
- (e) Rs. 2416

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Solutions

S1. Ans. (a)

Sol.

Let radius of sphere be $4x$.

So, radius of circle = $3x$

ATQ

$$\frac{4}{3} \times \pi \times (4x)^3 = 2304\pi$$

$$x = 3$$

So, radius of sphere and circle are 12 m and 9 m respectively.

$$\text{Area of circle} = \pi \times 9^2 = 81\pi \text{ m}^2$$

$$\text{Area of rectangle} = \frac{81 \times 22 \times 7}{7 \times 18} = 99 \text{ m}^2$$

Let length and breadth of rectangle be l and m respectively.

$$\text{So, } l \times b = 99 \text{ and } l - b = 2$$

From above equation

$$l = 11 \text{ and } b = 9$$

$$\text{So, required perimeter} = 2 \times (l + b)$$

$$= 2 \times 20 = 40 \text{ m}$$

S2. Ans. (c)

Sol.

$$\begin{aligned} \text{Total area of the wall} &= 2 \times 8 \times (12 + 9) \\ &= 336 \text{ m}^2 \end{aligned}$$

$$\begin{aligned} \text{Total area of both windows} &= 150 \times 80 + 200 \times 160 \\ &= 44000 \text{ cm}^2 \Rightarrow 4.4 \text{ m}^2 \end{aligned}$$

$$\text{Area of gate} = 350 \times 100 = 35000 \text{ cm}^2 \Rightarrow 3.5 \text{ m}^2$$

$$\text{Required area for painting} = 336 - 4.4 - 3.5 = 328.1 \text{ m}^2$$

$$\text{So, required cost of painting} = \frac{9843}{328.1} = \text{Rs. } 30 \text{ per m}^2$$

S3. Ans. (b)

Sol.

$$\text{Radius of sphere} = \sqrt[3]{\frac{4312 \times 3 \times 7}{3 \times 22 \times 4}} = 7 \text{ cm}$$

Let height of cylinder be h.

ATQ

$$\frac{2 \times \pi \times 7 \times (7+h)}{4 \times \pi \times 7 \times 7} = \frac{11}{7}$$

$$\frac{7+h}{14} = \frac{11}{7}$$

$$h = 15$$

$$\text{so, required volume} = \frac{1}{3} \times \frac{22}{7} \times 7 \times 7 \times 15 = 770 \text{ cm}^3$$

S4. Ans. (e)

Sol.

Let length and breadth of garden are l and b respectively.

$$l \times b = 4200 \quad \dots (i)$$

$$(l - 10) \times (b - 10) = 3000$$

$$lb - 10l - 10b + 100 = 3000$$

$$10l + 10b = 1300$$

$$l + b = 130 \quad \dots (ii)$$

From (i) and (ii)

$$l = 70 \text{ and } b = 60$$

$$\text{So, required length of wire} = \text{perimeter of garden} = 2(l + b)$$

$$= 2 \times 130 = 260 \text{ m}$$

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S5. Ans. (d)

Sol.

Let length of second rectangle be $7x$.

So, length of first triangle = $6x$

ATQ

$$2(7x + 22) - 2(6x + 22) = 8$$

$$14x - 12x = 8$$

$$x = 4$$

So, lengths of rectangles are 28 cm and 24.

$$\begin{aligned} \text{Required volume of cone} &= \frac{1}{3} \times \frac{22}{7} \times 14 \times 14 \times 24 \\ &= 4928 \text{ cm}^3 \end{aligned}$$

S6. Ans.(e)

Sol.

Given, area of square park = 19600 cm^2

$$a^2 = 19600$$

$$a = 140 \text{ cm}$$

$$\text{Radius of each light pole} = \frac{140}{50} = 2.8 \text{ cm}$$

Area covered by One pole in park

$$= \frac{22}{7} \times 2.8 \times 2.8$$

$$= 24.64 \text{ cm}^2$$

Total area covered by these nine poles

$$= 9 \times (24.64)$$

$$= 221.76 \text{ cm}^2$$

S7. Ans. (b)

Sol.

$$\text{T.S.A} = 2\pi r^2 + \pi r^2 + 2\pi r h = 2552$$

$$3\pi r^2 + 2\pi r \times 8 = 2552$$

$$3r^2 + 16r = \frac{2552}{22} \times 7$$

$$3r^2 + 16r = 812$$

$$3r^2 + 16r - 812 = 0$$

$$3r^2 + 58r - 42r - 812 = 0$$

$$r(3r + 58) - 14(3r + 58) = 0$$

$$r = 14, -\frac{58}{3}$$

$$\text{Required volume} = \frac{2}{3}\pi r^3 + \pi r^2 h$$

$$= \frac{2}{3} \times \frac{22}{7} \times (14)^3 + \frac{22}{7} \times (14)^2 \times 8$$

$$= 5749\frac{1}{3} + 4928$$

$$= 10677\frac{1}{3} \text{ cm}^3$$

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S8. Ans. (a)

Sol.

Let the breadth be l .

ATQ

$$22 \times 25 \times b = 2772 + 22 \times b \times (25 - 7)$$

$$22b \times (25 - 18) = 2772$$

$$b = \frac{2772}{22 \times 7}$$

$$b = 18$$

$$\begin{aligned} \text{So, total capacity of tank} &= 22 \times 18 \times 25 \\ &= 9900 \text{ m}^3 \end{aligned}$$

S9. Ans. (e)

Sol.

$$\text{Volume of removed mud from pit} = 10.5 \times 15 \times 18 = 2835 \text{ m}^3$$

$$\begin{aligned} \text{Area of remaining field} &= 30 \times 21 - 10.5 \times 15 = 630 - 157.5 \\ &= 472.5 \text{ m} \end{aligned}$$

$$\text{So, required rise of height} = \frac{2835}{472.5} = 6 \text{ m}$$

S10. Ans. (d)

Sol.

$$\text{Height of cylinder} = 3 \times \frac{100}{75} = 4 \text{ cm}$$

$$\text{Radius of cylinder} = \text{radius of cone} = \frac{4}{2} = 2 \text{ cm}$$

Let no. of cylinder and cone are x and $2x$ respectively.

ATQ

$$\frac{4}{3} \times \pi \times 12^3 = x \times \frac{1}{3} \times \pi \times 4 \times 3 + 2x \times \pi \times 4 \times 4$$

$$2304 = 4x + 32x$$

$$x = \frac{2304}{36} = 64$$

$$\text{So, required sum} = 3x = 192$$

S11. Ans. (b)

Sol.

$$\text{Let dimensions} = x, 2x, 3x$$

$$\text{Dimension of similar room} = 0.9x, 2.2x, 2.7x$$

Area to be painted of class room

$$x \times 2x + 2(x + 2x) \times 3x = 20x^2$$

$$\text{Area to be painted to similar room} = 0.9x \times 2.2x + 2(0.9x + 2.2x) \times 2.7x = 18.72x^2$$

$$\text{Cost of painting of classroom} = \frac{20x^2}{18.72x^2} \times 1872 = \text{Rs. } 2000$$



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