Quant Mega Quiz for SSC CGL Tier – 2 (Solutions)

S1. Ans.(c)

Sol.

The breadth of the rectangle field $= \frac{52000}{325}$

$\because$ [325 cm = 325 m] = 160 m

S2. Ans.(c)

Sol.

Area of field $= \frac{495.72}{36.72} = 13.5$ hectare

$= 135000\ m^2$

$h = x, b = 3x$

$\frac{1}{2} \times b \times h = 135000$

$\frac{1}{2} \times x \times 3x = 135000$

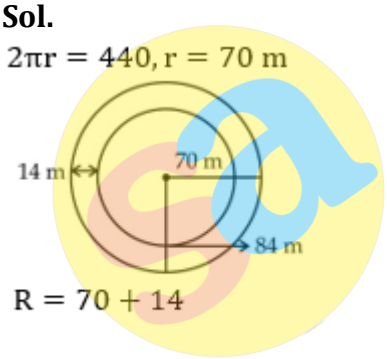
$x = 300$ m

& base = 3x = 900 m

S3. Ans.(b)

Sol.

$2\pi r = 440, r = 70$ m



$R = 70 + 14$

$= 84$m

S4. Ans.(a)

Sol.

ATQ,

$\pi r^2 = 124.74$ hectare

$\pi r^2 = 1247400\ m^2$

$r = 630$ m

$2\pi r = 3960$

Cost = 3960 × 0.8 = 3168

S5. Ans.(b)

Sol.

There are 12 equilateral triangle each of side 'a'

$= 12 \times \frac{\sqrt{3}}{4} (a)^2 = 3\sqrt{3}a^2$

S6. Ans.(a)

Sol.

Area $= \frac{1}{2} \times \pi \times (7)^2 + 2\left[\frac{1}{2} \times \pi \times \left(\frac{7}{2}\right)^2\right]$

= Area of larger semicircle + 2 (area of smaller semicircle)

= 115.5 cm^2

S7. Ans.(a)

Sol.

ATQ,

$\pi R^2 = \pi[r_1^2 + r_2^2 + r_3^2]$

$R^2 = [64 + 81 + 144]$

$R = 17$ m

S8. Ans.(b)

Sol.

ATQ,

$= \pi R_1^2 - \pi R_2^2$

$= \pi(R_1^2 - R_2^2)$

$= \pi(R_1 + R_2)(R_1 - R_2)$

$= \frac{22}{7} \times (23 + 12)(23 - 12)$

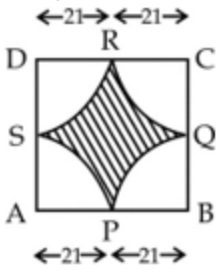
$= \frac{22}{7} \times 35 \times 11$

$= 1210\ m^2$

S9. Ans.(a)

Sol.

ATQ,

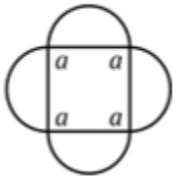


Ungrazed area = area of square – 4(area of quadrants)

$= (42)^2 - 4 \times \frac{1}{4} \times \pi(21)^2 = (21)^2[4 - \pi] = 378\ m^2$

S10. Ans.(c)
Sol.

Area of square = a^2

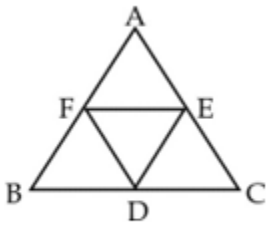


Area of circular parts $= 4 \times \frac{1}{2} \times \pi \times \left(\frac{a}{2}\right)^2$

Total area = $a^2 + \frac{\pi a^2}{2} = a^2\left(1 + \frac{\pi}{2}\right)$

S11. Ans.(a)
Sol.

All triangular field are equal in Area



$\frac{\text{Area of } \Delta ABC}{\text{Area of } \Delta DEF} = \frac{4}{1}$

S12. Ans.(c)
Sol.

ATQ –

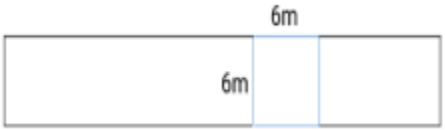
Area of park $= (120 + 80 - 24) \times 24$

$= 4224\ m^2$

S13. Ans.(d)
Sol. The circumference of the front wheel is 30 ft and that of the rear wheel is 36 feet.
Let the rear wheel make n revolutions. At this time, the front wheel should have made n+5 revolutions.
As both the wheels would have covered the same distance, n*36 = (n+5)*30
36n = 30n + 150
6n = 150
n = 25.
Distance covered = 25*36 = 900 ft.

S14. Ans.(c)
Sol. Folded part as shown in the first figure is a triangle - a right triangle.

The two perpendicular sides of the right triangle measure 6m each. So, the triangle is a right isosceles triangle.
When unfolded the folded area becomes a square as shown in the following figure.



The side of the square will be the width of the larger rectangle and is therefore, 6m.
Area of the square = 6 * 6 = 36 sq.m
When folded, only the area of the right triangle gets counted.
However, when unfolded the area of square gets counted.
The square comprises two congruent right triangles.
In essence, when folded only half a square is counted. When unfolded the entire square gets counted.
The area of the rectangle when unfolded = area of the rectangle when folded + area of half a square.
So area after unfolding= 144 + 18 = 162 sq.m.

S15. Ans.(b)
Sol. A circular road is constructed outside a square field. So, the road is in the shape of a circular ring.
If we have to determine the lowest cost of constructing the road, we have to select the smallest circle that can be constructed outside the square.
Therefore, the inner circle of the ring should circumscribe the square.
Perimeter of the square = 200 ft.
Therefore, side of the square field = 50 ft
The diagonal of the square field is the diameter of the circle that circumscribes it.
Measure of the diagonal of the square of side 50 ft = $50\sqrt{2}$ ft.
Therefore, inner diameter of the circular road = $50\sqrt{2}$.
Hence, inner radius of the circular road = $25\sqrt{2}$ ft.
Then, outer radius = $25\sqrt{2} + 7\sqrt{2} = 32\sqrt{2}$
The area of the circular road
$= \pi r_o^2 - \pi r_i^2$, where r_o is the outer radius and r_i is the inner radius.

$= \frac{22}{7} \times \{(32\sqrt{2})^2 - (25\sqrt{2})^2\}$

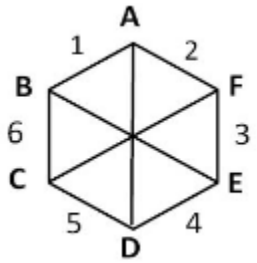
$= \frac{22}{7} \times 2 \times (32 + 25) \times (32 - 25)$

$= 2508$ sq. ft.

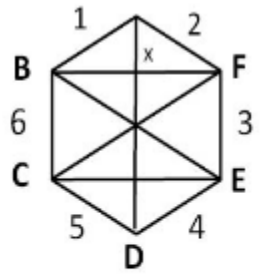
If per sq. ft. cost is Rs. 100, then cost of constructing the road = 2508 × 100 = Rs.2,50,800.
Cost of constructing 50% of the road = 50% of the total cost

$= \frac{250800}{2}$ = Rs.1,25,400

S16. Ans.(b)
Sol.



A regular hexagon comprises six equilateral triangles - each of side 2 m, the measure of the side of the regular hexagon - as shown above. The 6 triangles are numbered 1 to 6 in the figure shown above.
BX is the altitude of triangle 1 and XF is the altitude of triangle 2.
Both triangle 1 and triangle 2 are equilateral triangles.



Hence, BX = XF = $\frac{\sqrt{3}}{2} \times 2 = \sqrt{3}$

Therefore, BF, the length of the rectangle = $2\sqrt{3}$ m

Hence, the area of the rectangle BCEF = length * width = $2\sqrt{3} \times 2 = 4\sqrt{3}$ sq.m

S17. Ans.(d)
Sol. Let the radius of the circle be 'r' units.
The circumference of the circle will therefore be $2\pi r$ units.
If the radius is increased by 'x' units, the new radius will be (r + x) units.
The new circumference will be $2\pi(r+x)=2\pi r+2\pi x$
Or the circumference increases by $2\pi x$ units.

S18. Ans.(b)
Sol.
Total cost of fencing per metre = Rs. 2 + 1 = Rs. 3
Length of fencing required = Perimeter of the rectangular field
= 2 (Length + Breadth)
=> Length of fencing required = 2 x (100 + 50) = 300 metre
=> Amount paid to the contractor = Rs. 3 x 300 = 900
=> Amount paid to the land authority = 10 % of Rs. 900 = Rs. 90
Therefore, total cost of fencing = Rs. 900 + 90 = Rs. 990

S19. Ans.(b)
Sol. ATQ,

$$\pi r^2 = \frac{158400}{1400} \Rightarrow r^2 = 36$$

$$r = 6 \text{ m}$$

S20. Ans.(a)
Sol.
Each side of a square = a
Length and breadth = l & b

$$4a = 2(l + b)$$

$$a = \frac{(l+b)}{2}$$

Area of rectangle = $= l \times b$

Area of square $= a^2 = \frac{1}{4}(l+b)^2$

But since we know that –

$AM > GM$

$\frac{l+b}{2} > \sqrt{lb}$

$\left(\frac{l+b}{2}\right)^2 > lb$

Area of square > Area of rectangle

S21. Ans.(b)

Sol.

Required central angle $= \frac{42}{(20+42+40+35+43)} \times 360$

$= 84°$

S22. Ans.(a)

Sol.

$48 + 36 : 56 + 35$

$84 : 91$

$12 : 13$

S23. Ans.(a)

Sol.

Required percent $= \frac{(42+40+38)-(35+56)}{(35+56)} \times 100$

$= \frac{29}{91} \times 100 = 31.9$

S24. Ans.(d)

Sol.

Average production of type D $= \frac{205}{5} = 41$

So, in 2014 and 2015 production of car are less

S25. Ans.(c)

Sol.

Required percentage $= \frac{1500}{7500} \times 100 = 20\%$

S26. Ans.(a)

Sol.

Avg. no of failure in last 3 years

$= \frac{2500+1000+1000}{3} = \frac{4500}{3} = 1500$

S27. Ans.(c)
Sol.

$$\text{Req. percentage increase} = \frac{(168-148)}{148} \times 100 = 13.51$$

S28. Ans.(b)
Sol.

$$\text{Req. annual growth rate} = \frac{16}{32} \times \frac{100}{4} = 12.5$$

here '4' year annual growth that by divide of 4

S29. Ans.(a)
Sol.

$$\text{Required ratio} = \frac{(48+56+64+78+92)}{(105+123+125+148+161)} = \frac{169}{331}$$

S30. Ans.(c)
Sol. Total student in 2012 = 333
Total student in 2013 = 345
Total student in 2014 = 369
Total student in 2015 = 418
Total student in 2016 = 469
So, max. increase in the percentage of total number of students = 2015