G.S.C.E.

Solution of 2D

1b

Area of the hall= 3600*1500

Area of each stone= (60*50)

Therefore, number of stones= (3600*1500/ 60*50)= 1800

2b

Let, each side=a. Then, original area= a^2.

New side= 150a/100= 3a/2. New area= $9a^2/4$.

Required ratio= $9a^2/4:a^2$= 9:4

3a

d=12, r=6;

Volume of the largest sphere= $4/3\pi r^3$

= 4/3 *π*6*6*6= $288\pi cm^3$

4c

Area= Total cost/ Rate= (1215/135) hectares= (9*10000) sq.m.

Therefore, side of the square= Ö90000=300m.

Perimeter of the field= (300*4)m= 1200m

Cost of fencing= Rs.(1200*3/4)= Rs.900

5d

Required area= (63*63 – 4*1/4 *22/7 * 63/2 * 63/2)= $850.5m^2$

6C

2πr-r=37 or (2π-1)r=37.

Or (2* 22/7 -1)r=37 or 37r/7=37 or r=7.

Therefore, Area= πr^2= (22/7 *7*7)= 154 cm^2

7b

Let, length= x meters and breadth= y meters

Then xy=60 and $\sqrt{(x^2+y^2)}$ + x= 5

Therefore, x=60 and $(x^2+y^2)= (5y-x)^2$

Or xy=60 and $24y^2-10xy=0$.

Therefore, $24y^2-10*60=0$ or $y^2= 25$ or =5.

Therefore, x= (60/5)m= 12m. So, length of the carpet = 12m

8b

Length of wire= circumference of circle of radius 42cm= (2* 22/7* 42)= 264cm.

Therefore, perimeter of rectangle= 264 cm.

Let, length= 6x cm & breadth= 5x cm.

Therefore, 2 (6x+5x)= 264 or x=12.

Therefore, smaller side= 60 cm

9c

Area= $\sqrt{3}/4 *(3\sqrt{3})^2= 27\sqrt{3}/4$.

Therefore height= $27\sqrt{3}/4 *2/ 3\sqrt{3}= 9/2= 4.5$cm

10c

Distance moved by toothed wheel in 15 revolutions= (15*2*22/7*25)

Distance moved by smaller wheel in 1 revolution= (2*22/7*15)

Therefore, required number of revolutions= (15*44/7*25*7/ 44*15)= 25

11b

½ (12+8)d=840 or d=84m

12c

Perimeter= Distance covered in 8 min

= (12000/60 *8)m= 1600m

Let, length= 3x meters and breadth= 2x meters

Then, 2(3x+2x)= 1600 or x= 160

Therefore, length= 480 m and breadth= 320m

Therefore, area= $(480*320)m^2 = 153600\ m^2$

13b

Length of the diagonal= Distance covered in 3 min. at 4 km/hr.

= (4000/ 60 *3)= 200m.

Therefore, Area of the field= 1/2 * $diagonal^2$

= ½ * 200*200 = $20000\ m^2$

14C

2π(R-r)=60 => 2*22/7 * (R-r)=60.

Therefore, (R-r)= (66*7/44)= 10.5m

15b

Let the other sides be x and y. Then,

$X^2+y^2 = 13^2 = 169$. Also, ½ xy= 30 => xy=60.

Therefore, (x+y)= $\sqrt{((x^2+y^2)+2xy)} = \sqrt{(169+120)} = \sqrt{289}=17$.

(x-y)= $\sqrt{((x^2+y^2)-2xy)} = \sqrt{(169-120)} = \sqrt{49} = 7$.

Solving x+y=17, x-y=7, we get x=12 and y=5.

16d

360^0

17B

Perimeter = Distance covered in 8 min. = $\left(\frac{12000}{60} \times 8\right)$ m = 1600 m.

Let length = $3x$ metres and breadth = $2x$ metres.

Then, $2(3x + 2x) = 1600$ or $x = 160$.

$\therefore$ Length = 480 m and Breadth = 320 m.

$\therefore$ Area = (480 x 320) m^2 = 153600 m^2.

18B

$\frac{2(l + b)}{b} = \frac{5}{1}$

$\Rightarrow 2l + 2b = 5b$

$\Rightarrow 3b = 2l$

$b = \frac{2}{3}l$

Then, Area = 216 cm^2

$\Rightarrow l \times b = 216$

$\Rightarrow l \times \frac{2}{3}l = 216$

$\Rightarrow l^2 = 324$

$\Rightarrow l = 18$ cm.

19B

Area of the park = (60 x 40) m^2 = 2400 m^2.

Area of the lawn = 2109 m^2.

$\therefore$ Area of the crossroads = (2400 - 2109) m^2 = 291 m^2.

Let the width of the road be x metres. Then,

$60x + 40x - x^2 = 291$

$\Rightarrow x^2 - 100x + 291 = 0$

$\Rightarrow (x - 97)(x - 3) = 0$

$\Rightarrow x = 3$.

20C

$$\text{Other side} = \sqrt{\left(\frac{15}{2}\right)^2 - \left(\frac{9}{2}\right)^2}\ \text{ft}$$

$$= \sqrt{\frac{225}{4} - \frac{81}{4}}\ \text{ft}$$

$$= \sqrt{\frac{144}{4}}\ \text{ft}$$

$$= 6\ \text{ft.}$$

$\therefore$ Area of closet = (6 x 4.5) sq. ft = 27 sq. ft.

21D

Let original length = x and original breadth = y.

$$\text{Decrease in area} = xy - \left(\frac{80}{100}x \times \frac{90}{100}y\right)$$

$$= \left(xy - \frac{18}{25}xy\right)$$

$$= \frac{7}{25}xy.$$

$$\therefore \text{ Decrease \%} = \left(\frac{7}{25}xy \times \frac{1}{xy} \times 100\right)\% = 28\%.$$

22B

$\sqrt{l^2 + b^2} = \sqrt{41}$.

Also, $lb = 20$.

$(l + b)^2 = (l^2 + b^2) + 2lb = 41 + 40 = 81$

$\Rightarrow (l + b) = 9.$

$\therefore$ Perimeter = $2(l + b)$ = 18 cm.

23B

Let original length = x and original breadth = y.

Original area = xy.

New length = $\frac{x}{2}$.

New breadth = $3y$.

New area = $\left(\frac{x}{2} \times 3y\right) = \frac{3}{2}xy$.

$\therefore$ Increase % = $\left(\frac{1}{2}xy \times \frac{1}{xy} \times 100\right)\% = 50\%$.

24D

We have: l = 20 ft and lb = 680 sq. ft.

So, b = 34 ft.

$\therefore$ Length of fencing = $(l + 2b)$ = (20 + 68) ft = 88 ft.

25C

Area to be plastered $= [2(l + b) \times h] + (l \times b)$

$= \{[2(25 + 12) \times 6] + (25 \times 12)\}\ m^2$

$= (444 + 300)\ m^2$

$= 744\ m^2$.

$\therefore$ Cost of plastering = Rs. $\left(744 \times \frac{75}{100}\right)$ = Rs. 558.