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Subject	✓	Estimation
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Q No # 01

$$\Rightarrow \text{External length of building,} \\ = 14' + 14' + 2(1.125) + 0.75 \\ = \underline{31'}$$

$$\Rightarrow \text{External breadth of building} \\ = 12' + 8' + 2(1.125) + 0.75 \\ = \underline{23'}$$

$$\Rightarrow \text{Plinth Area of building} = 31' \times 23' \\ = \underline{713 \text{ ft}^2}$$

$$\Rightarrow \begin{aligned} \text{Rate of construction} &= \text{Rs} - 300 / \text{sqft} \\ \text{Cost of construction} &= 713 \times 300 \\ &= \text{Rs} = \underline{213900/-} \end{aligned}$$

$$\Rightarrow \begin{aligned} \text{water supply and sanitary } &10\% \\ &= 213900 \times 10/100 \\ &= \underline{\text{Rs } 21390} \end{aligned}$$

$$\Rightarrow \begin{aligned} \text{Cost of Electric supply is } &10\% \\ &= 213900 \times 10/100 \\ &= \underline{\text{Rs } 21390} \end{aligned}$$

$$\Rightarrow \begin{aligned} \text{Cost of gas supply is } &5\% \\ &= 213900 \times 5/100 \\ &= \underline{\text{Rs } 10695} \end{aligned}$$

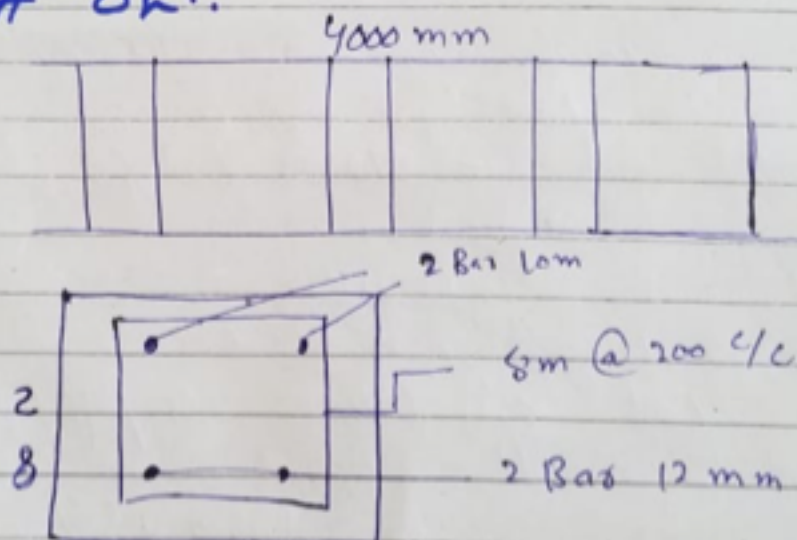
(2)

$$\begin{aligned} \Rightarrow \text{Total cost} &= 213900 + 13900 + 21390 + 21390 + 10695 \\ &= \text{Rs } \underline{267375} \end{aligned}$$

$$\begin{aligned} \Rightarrow \text{Contingencies } 3\% \text{ of total cost} \\ &= 267375 \times \frac{3}{100} \\ &= \underline{8021.25} \end{aligned}$$

$$\begin{aligned} \Rightarrow \text{Grand Total} &= 267375 + 8021.25 \\ &= \underline{275396.25} \end{aligned}$$

Q No # 02..



Step No # 01 :-

(length of bar 12mm bottom bar)

$$\begin{aligned} \text{Length of steel 12 mm} &= (\text{length of beam} - \text{cover}) \times \\ &\quad \text{No of bar} \\ &= 4000 - 2(30) \times 2 \\ &= 3880 \text{ mm or } 3.8 \text{ m} \end{aligned}$$

(3)

Step No # 02:- (length of bar 10 mm top bar)

length of steel 10mm = (length of beam - cover) x No  
of bars

$$= 4000 - 2(30) \times 2$$

$$= 3880 \text{ mm or } 3.8 \text{ m}$$

Step No # 03

weight of bar 12 mm bottom bar

$$= (d^2 / 162) \times L$$

$$= ((12)^2 / 162) \times 3.88$$

$$= 3.448 \text{ kg.}$$

Step # 4 weight of 10mm top bar

$$(d^2 / 162) \times L$$

$$= (10^2 / 162) \times 3.88$$

$$= 2.4 \text{ kg}$$

Step # 5 No of stirrups

$$= (\text{length of beam} / \text{spacing}) + 1$$

$$= (4000 / 300) + 1$$

$$= 21 \text{ No's}$$

(4)

Step No # 6 Total length of stirrup  
 cutting length x No of stirrups  
 $= 0.648 \times 21$   
 $= 13.608 \text{ m}$

Step No # 06 (Cutting length of stirrup)  
 $(2(x) + 2(y) + \text{hook} (10d) - \text{bend} (2d \text{ if } 90 \text{ degree}))$   
 $= (2 \times 142) + 2(142) + (2 \times 10 \times 8) - (5 \times 2 \times 8)$   
 $= 284 + 284 + 160 - 80$   
 $= 648 \text{ mm or } 0.648 \text{ m}$

Step No # ~~06~~ 07 (Total length of stirrup)  
 cutting length x No of stirrups  
 $0.648 \times 21$   
 $= 13.608 \text{ m}$

Step No # 08 (Weight of stirrup)  
 $(d^2 / 162) \times L$   
 $((8)^2 / 162) \times 13.608$   
 $= 5.38 \text{ Kg}$

(5)

## BBS for RCC Beam -

S.No	Type of Bar	Dia mm	No. S	Length m	Unit weight
1		10mm	2	3.88	2.4 kg
2		12mm	2	3.88	3.48 kg

### Q No # 03

Step # 01:~

Effective length :-

$$\text{Effective length (x)} = \text{length} - b/\text{side covers} \\ = 2000 - 2 \times 50 = 1900 \text{ mm}$$

$$\text{Eff. length (y)} = 2000 - 2 \times 50 = 1900 \text{ mm}$$

Step No # 2

No's of bar :-

$$\text{No's of bar (x)} = \text{eff. length} / \text{spacing} + 1 \\ = (1900/150) + 1 = 13.6 \\ = 14 \text{ Nos.}$$

$$\text{No's of bar (y)} = \text{eff. length} / \text{spacing} + 1 \\ = (1900/150) + 1 = 13.6 \\ = 14 \text{ No's.}$$

Step No # 03

Cutting length :-

$$\text{A long (x)} = [\text{eff. length} + (\text{bends})] - \text{end deductions.}$$

(6)

$$1900 + 2(300 - 50 - 50) - (2(2 \times 12))$$

$$= 2252 \text{ mm or } 2.5 \text{ m}$$

Actual (y) = [eff. length + (bends)] - dent deduction (2d)

$$= 1900 + 2(300 - 50 - 50) - (2(2 \times 12))$$

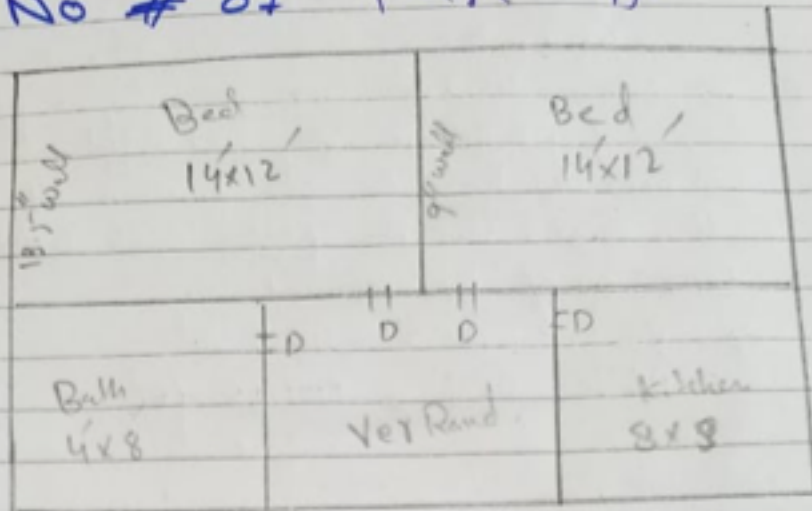
$$= 2252 \text{ mm}$$

$$= 2.5 \text{ m}$$

SNO	Type of bar	dia	No	Length	Total length	weight kg/m	Total weight	Total weight
1	x-dia bar	12	14	2.25	89.5	0.89	20	$2^2 / 162 = 0.89$
2	y-dia bar	12	14	2.25	89.5	0.89	20	$2^2 / 162 = 0.89$
							42 kg	
							2%	
							44 kg	

(7)

Q No # 01 Part (b)



Calculate plaster area for Room' bath and kitchen

- Height of wall = 3m
- Door size = 2m x 1m

Solution:

For bedroom ① :-  
Step No # 01 :- (Total wall length)

$$\begin{aligned} \text{Length of wall} &= 14 + 12 + 14 + 12 \\ &= 52 \text{ ft} = 52 / 3.28 = 15.8 \text{ m} \end{aligned}$$

Step No # 2

(Total Area of wall)

$$\begin{aligned} \text{Total area of wall} &= \text{Length} \times \text{Height} \\ &= 15.8 \times 3 = 47.7 \text{ m}^2 \end{aligned}$$

$$\begin{aligned} \text{Total area of door} &= 2 \times 1 \\ &= 2 \text{ m}^2 \end{aligned}$$

Step No # 03

$$\text{Plaster Area} = \text{Area of wall} - \text{Area of door}$$

deduct door area from area of



= 47.2 - 2  
= 45.2 m<sup>2</sup>

Plaster area = 45.2 m<sup>2</sup> or in square ft  
Plaster area = 491.65 ft<sup>2</sup>

As bed room (2) has the same dimension of Area of wall, Door, so its plaster area will be same as of bed room (1)

⇒ plaster area = 45.2 m<sup>2</sup>  
Plaster area = 491.65 ft<sup>2</sup>

For bathroom

Total length of wall = 4' + 8' + 4' + 8'  
= 24 ft  
= 24 / 3.28 = 7.3 m

Total area of wall = Length x Height  
= 7.3 x 3 = 21.9 m<sup>2</sup>

Total area of door = 2 m x 1 m  
= 2 m<sup>2</sup>

Plaster area = Area of wall - Area of door  
= 21.9 - 2  
= 19.9 m<sup>2</sup>

So Plaster Area = 19.9 m<sup>2</sup> or square ft  
= 19.9 x (3.28)<sup>2</sup> =  
Plaster area = 214.09 ft<sup>2</sup>

For kitchen

Total length of wall = 8' + 8' + 8' + 8'  
= 32 ft ⇒ 32 x 3.28 = 9.7 m

⇒ Total area of door = 2 m x 1 m = 2 m<sup>2</sup>

⇒ Plaster area = Area of wall - Area of Door = 29.1 - 2 = 27.1 m<sup>2</sup>

So Plaster area = 27.1 m<sup>2</sup> or sq. ft = 27.1 x (3.28)<sup>2</sup>  
= 291.55 ft<sup>2</sup>

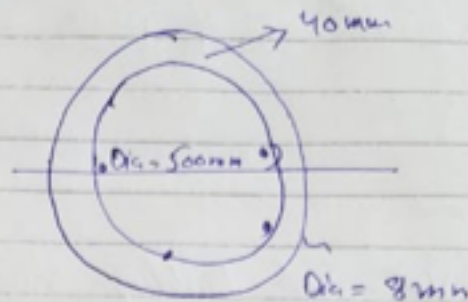
(9)

~~Q No # 04  
part "B"~~

~~Value of  $\rho$~~

Q No # 04

1)



Circular Column:-

Dia of column is = 500 mm

Dia of stirrup  $c/c$  =

$$500 - (2 \times 40) - (4 + 4) = \underline{412 \text{ mm}}$$

Parameter of stirrup

$$\pi d = 3.142 \times 420 = \underline{1294.504}$$

Hook length =  $10D \circ$

$$10 \times 8 = 80 \times 2 = \underline{160 \text{ mm}}$$

Cutting length of stirrup =  
parameter of stirrup + Hook L

$$= 1294.504 + 160 \text{ mm}$$

$$= \frac{1479.64}{1000}$$

$$= \underline{1.4796 \text{ m}}$$

(18)

Part B Q No # 04

Solution:-

$$\Rightarrow \text{Value of plot} = 350000 \text{ /-}$$

$$\text{Rate of rent} = 6\%$$

$$\text{Annual rent of plot} = \frac{350000 \times 6}{100}$$
$$= 21000 \text{ /-}$$

$$\Rightarrow \text{Value of building structure} = 420000 \text{ /-}$$

$$\text{Rate of rent } 8\% = 8\%$$

$$\text{Annual rent for structure} = \frac{420000 \times 8}{100}$$
$$= 33600$$

$$\text{Total ~~annual~~ Annual rent} = 21000 + 33600$$

$$= \frac{54600}{12} = 4550$$

Q No # 05

Ans: Alternative dispute resolution :-

- Alternative dispute resolution is often referred to as ADR.
- It describe the ways that parties can settle civil disputes with the help of an independent third part with out the need for a formal court hearing.
- Alternative dispute resolution refers variety of process that help parties to resolve dispute with out a trial.

Types :-

Main type ADR	other
Arbitration	Neutral evaluation
Mediation	Ombudsmen
Negotiation	Avoidance
Conciliation	

Arbitration Act - 1996, s. 1

- a) The object of arbitration is to obtain the fair resolution of disputes by an impartial tribunal (equality) without unnecessary delay or expense.
- b) The parties should be free to agree how their dispute are resolved subject only to such safeguards as are necessary in the public interest
- c) In matters governed by this part the court should

Intervene ~~except~~ except as provided by this part.

### Arbitration Act - 1996's:

Arbitration act when a party tries to ignore an Arbitration clause agreed in a contract, the court in which he and she is trying to make his claim will order a 'Stay' of proceeding so that the matter may be referred to arbitration as agreed in the contract.

### Advantage: of

- 1) More flexibility.
- 2) Select your own Arbitration or mediator.
- 3) A Jury is not involved.
- 4) Expenses are reduced.
- 5) A DR is speedy.
- 6) The results can be kept confidential.
- 7) Party participation.
- 8) Fosters cooperation.

### ~~Disadvantage~~ :-

### Disadvantage:-

- 1) There is no guaranteed resolution.
- 2) Arbitration decision are final.
- 3) Limits on Arbitration awards.
- 4) Discovery limitation.
- 5) Fee for the Neutral.
- 6) May have no choice.
- 7) Non binding arbitration.