

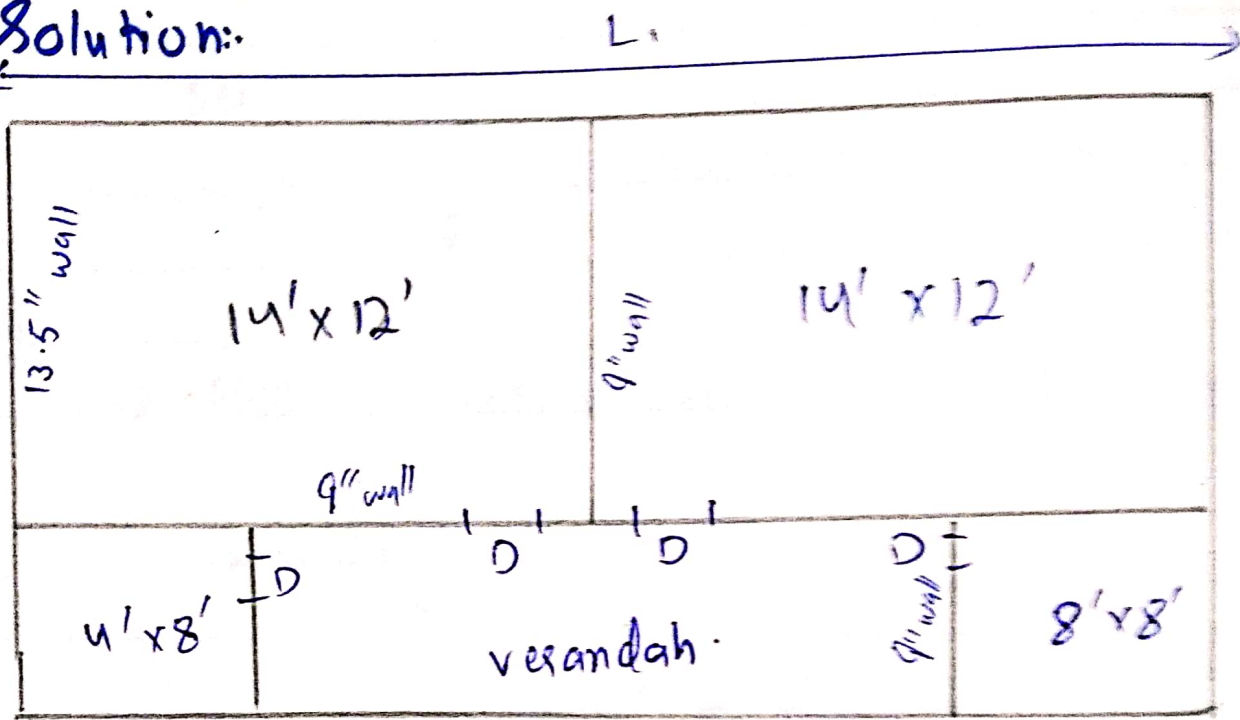
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Paper :- Quantity surveying
and Estimation

Q1 (Part 1)

Solution:



STEP 1: (External length of building)

$$L_1 = 14' + 14' + 2(13.5/12)' + (9/12)'$$
$$\Rightarrow L_1 = 31 \text{ ft}$$

STEP 2: (External breadth of building)

$$L_2 = 12' + 8' + 2(13.5/12)' + (9/12)'$$
$$L_2 = 23 \text{ ft}$$

STEP 3:

Plinth area of building

$$= 31 \times 23 = 713 \text{ sq.ft.}$$

⇒ Rate of construction = Rs 300/sqft

so

$$\text{cost of construction} = 713 \times 300 \\ = \text{Rs } 213900$$

Now

⇒ cost of water supply and sanitory = 10%

$$\text{sanitory} = \frac{10 \times 213900}{100} \\ = 21390/-$$

⇒ cost of electric supply = $10 \times \frac{213900}{100}$

$$= 21390/-$$

⇒ cost of gas supply = $\frac{5 \times 213900}{100}$

$$= 10695/-$$

$$\text{Total cost} = 213900 + 21390 + 21390 \\ + 10695 \\ = \text{Rs } 267375$$

PTO

Now

$$\text{contingencies} = \frac{3 \times 267375}{100}$$

$$= 8021.25 \text{ /-}$$

$$\text{Grand total} = 267375 + 8021.25$$

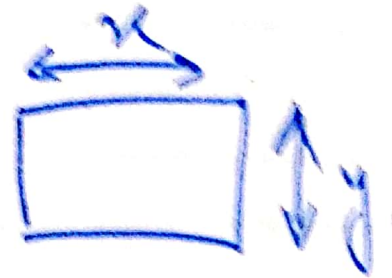
$$\boxed{= \text{Rs } 275396.25}$$

Q1

Part 2

Plaster for internal walls

Internal walls length in
x direction



$$= 4(14') + 2(8') + 2(4') + \underbrace{[(14'-4') + (14'-8')]}_{\text{veranda walls}}$$
$$= 96'$$

y direction

$$= (4 \times 12') + 2(8') + 2(8') + \underbrace{[2 \times 4 \times 8']}_{\text{veranda walls}}$$
$$= 112'$$

$$\text{total} = 112 + 96 = 208'$$

door size = 2 x 1
4 door = 8 sq ft.

Plaster = wall area - Door area

$$\text{Plaster} = ((208 \times 0.3048 \text{ m}) \times 3 \text{ m}) - (8 \times 0.0929) \text{ m}^2$$

$$= 189.452 \text{ m}^2$$

Q. 2

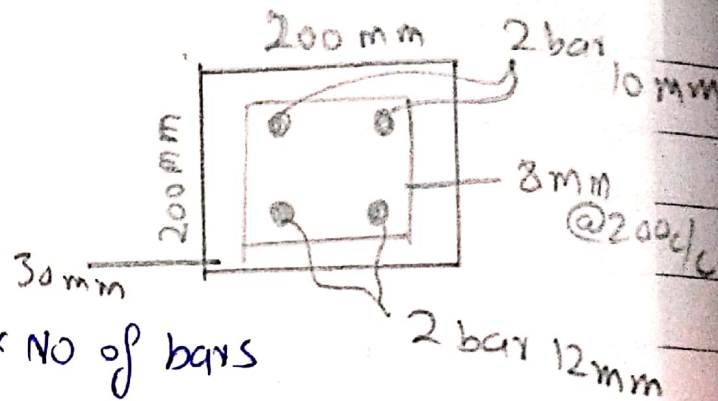
Solution:

Given length of beam = 4000 mm

STEP 1 (length of bottom bars)

L of \Rightarrow (length of beam - cover) \times No of bars
12 mm

$$= (4000 - 2(30)) \times 2$$
$$= 7880 \text{ mm or } 7.88 \text{ m}$$



STEP 2 (length of top bars)

$$\text{Top bars length (10 mm)} = (4000 - 2(30)) \times 2$$
$$= 7880 \text{ mm or } 7.88 \text{ m}$$

STEP 3 (weight of 12 mm bar)

$$= (d^2/162) \times L$$
$$= (12^2/162) \times 7.88$$
$$= 7 \text{ kg}$$

STEP 4 (weight of 10 mm bar)

$$= (d^2/162) \times L$$
$$= (10^2/162) \times 7.88$$

$$= 4.86 \text{ kg}$$

For stirrups

⇒ No of stirrups:

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

$$= (4000/200) + 1$$

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

⇒ cutting length of stirrup.

$$= (2(x) + 2(y) + \text{hook}(10d) - \text{bend}(2d))$$

$$= (2 \times 132) + 2(132) + (2 \times 10 \times 8) - (5 \times 2 \times 8)$$

$$= 264 + 264 + 160 - 80$$

$$= 608 \text{ mm or } 0.608 \text{ m.}$$

⇒ Total length of stirrups

$$= 0.608 \times 21$$

$$= 12.768 \text{ m}$$

⇒ weight of stirrups:

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

$$= (8^2/162) \times 12.768$$

$$= 5 \text{ kg.}$$

Type of bar	Dia (mm)	No.s	Total length (meter)	Unit weight (kg)	Total weight (kg)
12mm bottom	12	2	7.88	0.89	7kg
Top	10	2	7.88	0.61	4.86
Stirrup	8	21	12.768	0.39	5
Total					16.86
St. wastage					<u>0.843</u>
Grand total					17.70kg

X ————— X

Q3

SOLUTION:

STEP 1: (finding the effective length)

$$\begin{aligned} \text{EFF length (x)} &= \text{length} - \text{both side covers} \\ &= 2000 - (2 \times 50) = 1900 \text{ mm} \end{aligned}$$

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

STEP 2: (finding No of bars)

$$\begin{aligned} \text{No of bars (x)} &= (\text{Eff length} / \text{spacing}) + 1 \\ &= (1900 / 150) + 1 \\ &= 14 \text{ Nos} \end{aligned}$$

$$\begin{aligned} \text{No of bars (y)} &= (1900 / 150) + 1 \\ &= 14 \text{ Nos} \end{aligned}$$

STEP 3: (Finding the cutting length)

$$\text{Along}(x) = [\text{EFF length} + [\text{bends}] - \text{bent deductions}]$$

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

$$= 2252 \text{ mm or } 2.25 \text{ m}$$

$$\text{Along}(y) = [\text{EFF length} + [\text{bends}] - \text{bent deductions}]$$

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

$$= 2252 \text{ mm or } 2.25 \text{ m}$$

Type of bar	Dia(mm)	No	Length(m)	Total length	Weight (kg/m)	Total weight (kg)
x(direction)	12	14	2.25	22.5	0.89	20
y(direction)	12	14	2.25	22.5	0.89	20
Total						40
5% wastage						2
Gross weight						40 42 kg

Q4 (Part 1)
Solution:-

Dia of column:
500 mm

Dia of stirrup/c:

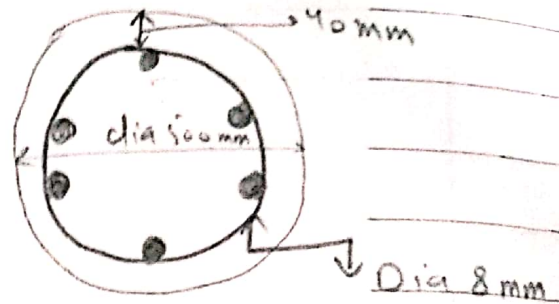
$$500 - (2 \times 40) - (4 + 4) = 412 \text{ mm}$$

Parameter of stirrup = πd
 $= 3.142 \times 412 = 1294.504 \text{ mm}$

Hook length = $10 D$
 $= 10 \times 8 \Rightarrow 80 \times 2 = 160 \text{ mm}$

Cutting length of stirrup =

Parameter of stirrup + Hook L
 $= 1294.504 + 160$
 $= 1454.504 \text{ mm}$
 $\rightarrow 1454.504 / 1000$
 $= 1.454 \text{ m}$



Q4 (Part 2)

Solution:

Value of plot = Rs 350,000

Rent rate = 6% on land

$$\begin{aligned}\text{Rent on plot/land} &= \frac{6 \times 350,000}{100} \\ &= \text{Rs } 21000\end{aligned}$$

Now

Cost of constructed building = Rs 420,000

Rent rate = 8%

$$\begin{aligned}\text{Rent of construction cost} &= \frac{420,000 \times 8}{100} \\ &= 33600\end{aligned}$$

Annual

$$\begin{aligned}\text{Total } \uparrow \text{ Rent} &= 21000 + 33600 \\ &= \text{Rs } 54600\end{aligned}$$

$$\text{monthly } \downarrow \text{ } = \frac{54600}{12} = 4550.$$

Q5

Main types of ADR:-

The most common ADR Form are conciliation, mediation, arbitration, neutral evaluation, settlement conferences & community dispute resolution.

1) Facilitation:-

A neutral third party works with both sides to reach a resolution of their dispute.

2) Mediation:-

An impartial mediator helps the parties try to reach a mutually acceptable resolution to the dispute.

3) Arbitration:-

It is the most formal one. The arbitrator hears arguments from each side and decides the outcome.

4) Neutral evaluation:-

A procedure where each party presents their case to a neutral party who gives an opinion on the strengths and weaknesses of each party's evidence and how the dispute shall be settled.

5) Settlement conference

The judge or a referee will meet
as possible a settlement. The parties will discuss

Arbitration Act 1996

Section 1 General principals

- the object of arbitration is to obtain the fair ~~and~~ resolution of disputes by an impartial tribunal with an unnessary delay or expense
- the parties should be free to agree how their disputes are resolved
- in matters governed by this part the court should not intervene except as provided by this part

Section 9 Stay of legal proceedings

- A party to an arbitration agreement brought in respect of a matter which is to be referred to an arbitration agreement

arbitration may apply to the court
in which proceeding have been brought
to stay the proceedings so far
as the concern the matter.

2) An application may be made not
withstanding that the matter is
to be referred to arbitration
only after exhaustion of other
procedures.

section 18 → failure of appointment
procedures

in this the conditions are given
in case an procedure fails.

Advantages

- 1) More flexibility
- 2) select your own Arbitrator
- 3) A jury is not involved
- 4) Expenses are reduced-
- 5) speedy process

Disadvantages ✓

- 1) There is no guaranteed resolution
- 2) Arbitration decisions are final
- 3) Limits on Arbitration awards
- 4) Fee for the neutral.

