

Final Exam

Subject :: Quantity Survey &  
Estimation

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Q No: 01(a)

"Solution"

$$\begin{aligned} \text{External length of building} &= \\ 14' + 14' + 2(1.125) + 0.75 &= \\ &= 31 \text{ ft} \end{aligned}$$

$$\begin{aligned} \text{External breadth of building} &= \\ 12' + 8' + 2(1.125) + 0.75 &= \\ &= 23 \text{ ft} \end{aligned}$$

$$\begin{aligned} \text{Plinth Area of the building} &= 31 \times 23 \\ &= 713 \text{ ft}^2 \end{aligned}$$

$$\text{Rate of Construction} = \text{Rs. } 300/\text{ft}^2$$

$$\begin{aligned} \text{Cost of Construction} &= 713 \times 300 \\ &= \text{Rs. } 213900/- \end{aligned}$$

$$\begin{aligned} \text{Water Supply \& Sanitary } 10\% &= \\ &= 213900 \times 10/100 \end{aligned}$$

$$\text{Rs } 21390/-$$

$$\begin{aligned} \text{Cost of Electric Supply is } 1\% \\ &= 213900 \times \frac{1}{100} \\ &= \text{Rs } 21390 \end{aligned}$$

$$\begin{aligned} \text{Cost of gas Supply is } 5\% \\ &= 213900 \times \frac{5}{100} \\ &= \text{Rs } 10695 \end{aligned}$$

$$\begin{aligned} \text{Total Cost} &= 213900 + 21390 + 21390 \\ &\quad + 10695 \\ &= \text{Rs } 267375 \end{aligned}$$

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

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

∴

$$= 275396.25$$



Q No.: 1(b)

"Solution"

For bedroom (1):-

Step # 1 (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 # 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 # 3 (deduct door area from area of wall)

$$\text{Plaster Area} = (\text{Area of wall} - \text{Area of Door})$$

$$= 47.7 - 2$$

$$= 45.7 \text{m}^2$$

$$\text{Plaster area} = 45.7 \text{m}^2$$

or in Square feet

$$= 45.7 \times (3.28)^2$$

$$= 491.65 \text{ft}^2$$

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

$$\Rightarrow \text{Plaster Area} = 45.7 \text{ m}^2$$
$$\Rightarrow \text{Plaster Area} = 491.65 \text{ Ft}^2$$

For Bathroom:

$$\begin{aligned} \text{total length of wall} &= 4' + 8' + 4' + 8' \\ &= 24 \text{ ft} \\ &= \frac{24}{3.28} = 7.3 \text{ m} \end{aligned}$$

$$\begin{aligned} \text{total Area of wall} &= L \times H \\ &= 7.3 \times 3 = 21.9 \text{ m}^2 \end{aligned}$$

$$\begin{aligned} \text{total Area of Door} &= 2 \text{ m} \times 1 \text{ m} \\ &= 2 \text{ m}^2 \end{aligned}$$

$$\begin{aligned} \text{Plaster Area} &= \text{Area of wall} - \text{Area of Door} \\ &= 21.9 - 2 \\ &= 19.9 \text{ m}^2 \end{aligned}$$

So

$$\text{Plaster Area} = \underline{\underline{19.9 \text{ m}^2}}$$



In Square Feet

$$= 19.9 \times (3.28)^2$$

$$P.A = \underline{\underline{214.09 \text{ Ft}^2}}$$

For Kitchen :-

$$\text{Total length of wall} = 8' + 8' + 8' + 8'$$

$$= 32 \text{ ft}$$

$$= 32 / 3.28 = 9.7 \text{ m}$$

$$\text{Total Area of wall} = L \times H$$

$$= 9.7 \times 3 = 29.1 \text{ m}^2$$

$$\text{Total Area of Doors} = 2 \text{ m} \times 1 \text{ m} = 2 \text{ m}^2$$

~~Plaster Area of Doors =~~

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

$$= \boxed{29.1 - 2 = 27.1 \text{ m}^2}$$

$$\text{Plaster Area} = 27.1 \text{ m}^2$$

or In Square Feet

$$\text{Plaster Area} = 27.1 \times (3.28)^2$$

$$= \boxed{291.55 \text{ Ft}^2}$$

Q No:-2

"Solution"

Step # 01 (Length of bar 12mm bottom bar)

$$\begin{aligned}\text{Length of Steel 12mm} &= (\text{length of beam} - \text{Covers}) \\ &\quad \times \text{No of bars} \\ &= 4000 - 2(30) \times 2 \\ &= 3880\text{mm OR } 3.88\text{m}\end{aligned}$$

Step # 02 (Length of bar 10mm top bar)

$$\begin{aligned}\text{Length of Steel 10mm} &= (\text{length of beam} \\ &\quad - \text{Covers}) \times \text{No of bars} \\ &= 4000 - 2(30) \times 2 \\ &= 3880\text{mm OR } 3.88\text{m}\end{aligned}$$

Step # 03 (weight of bar 12mm bottom bar)

$$\begin{aligned}&= \left(\frac{d^2}{162}\right) \times L \\ &= \left(\frac{12^2}{162}\right) \times 3.88 \\ &= 3.448\text{ kg}\end{aligned}$$



Step # 04 (weight of 10mm top bars)

$$\begin{aligned} &= (d^2/162) L \\ &= 10^2/162 \times 3.88 \\ &= 2.4 \text{ kg} \end{aligned}$$

Step # 05 (No of Stirrup)

$$\begin{aligned} &= (\text{Length of beam} / \text{Spacing}) + 1 \\ &= (4000/300) + 1 \\ &= 21 \text{ No's} \end{aligned}$$

Step No # 06 (cutting length of Stirrup)

$$\begin{aligned} &= 2(x) + 2(y) + \text{hook} (1d) - \text{bend} (2d \text{ if } 90 \text{ degree}) \\ &= (2 \times 142) + 2(142) + (2 \times 10 \times 8) - (5 \times 2 \times 8) \end{aligned}$$

$$284 + 284 + 160 - 80$$

$$648 \text{ mm}$$

OR

$$0.648 \text{ m}$$



Step # 07 (Total length of Stirrup)  
= Cutting length  $\times$  No of Stirrups

$$= 0.648 \times 21$$

$$= 13.608 \text{ m}$$

Step # 08 (Weight of Stirrup)

$$= \left( \frac{d^2}{162} \right) \times L$$

$$= \left( \frac{8^2}{162} \right) \times 13.608$$

$$= 5.38 \text{ kg}$$

BBS for RCC Beam

S.No	Types of bars	Dia mm	Nos	Length (m)	Unit weight
1		10mm	2	3.88	2.4 kg
2		12mm	2	3.88	3.44 kg
3					

Q No.: 3

Step = 01 Effective length:-

Eff length (x) = Length - both side covers

$$= 2000 - 2 \times 50 = 1900 \text{ mm}$$

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

Step = 02 No's of Bar:-

No's of Bar (x) =  $\frac{\text{Eff Length}}{\text{Spacing}} + 1$

$$= \frac{1900}{150} + 1 = 13.6$$

= 14 No's

No's of Bar (y) =  $\frac{1900}{150} + 1$

$$= 13.6 = 14 \text{ No}$$

Step = 03 Cutting length:-

Along (x) =  $[\text{eff length} + \text{bends}] - \text{bend deduction}$



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

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

$$\text{Along (g)} = 1900 + 2(300 - 50 - 50) - (2(2 \times 12))$$

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

S.No	Type of bar	Dia (mm)	No	Length	total weight	weight	total (wert)	total weight
1	x-axis	12	14	2.25	22.5	0.89	20	$\frac{12^2}{162} = 0.89$
2	y-axis	12	14	2.25	22.5	0.89	20	$\frac{12^2}{162} = 0.89$
total							42 kg	
Add 5% waste							2%	
Gross weight							44 kg	



Q No.: 4 (1)

" Solution "

$$\text{Dia of Column} = 500 \text{ mm}$$

$$\begin{aligned} \text{Dia of Stirrup} &= 500 \text{ mm} - (2 \times 40) - (4 \times 4) \\ &= 500 - 80 - 8 \\ &= 412 \text{ mm} \end{aligned}$$

$$\begin{aligned} \text{Parameter of Stirrup} &= \pi d = \pi \times 412 \\ &= 1294.37 \text{ mm} \end{aligned}$$

$$\begin{aligned} \text{Hook length} &= 10D = 10 \times 8 = 8 \times 2 \\ &= 160 \end{aligned}$$

$$\begin{aligned} \text{Cutting length of Stirrup} &= \\ &(\text{Parameter of Stirrup} + \text{Hook length}) \end{aligned}$$

$$= 1294.37 + 160$$

$$= 1454.37 \text{ mm}$$

OR

$$\boxed{1.454 \text{ m}}$$

Q No: 4(b)

"Solution"

$$\text{Value of Plot} = 350000/-$$

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

$$\begin{aligned} \text{Annual rent of Plot} &= \frac{350000 \times 6}{100} \\ &= 21000 \end{aligned}$$

$$\begin{aligned} \text{Value of building Structure} &= 420000 \end{aligned}$$

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

$$\begin{aligned} \text{Annual rent for Structure} &= \frac{420000 \times 8}{100} \\ &= 33600 \end{aligned}$$

$$\begin{aligned} \text{Total Annual rent} &= 21000 + 33600 \\ &= 54600 \\ &= \frac{54600}{12} = \boxed{4550} \end{aligned}$$



Q5 Define the main types of Alternative dispute resolution along with Arbitration Act 1996 Section 1, Section 9 & Section 18? What are the advantages & disadvantages of ADR in terms of Construction project.

Ans The main types of "ADR" are as following:-

(1) Arbitration :- Arbitration is the adjustment of a dispute by one or more specially appointed experts or lawyers.

- Arbitration involves an independent third party who actually makes suggestions & actually imposes a decision on the parties.

- People who work as arbitrators often belong to the Chartered Institute of Arbitrators.

- Arbitration is binding.

## Arbitration Act - 1996 S.1

- (a) The object of arbitration is to obtain the fair resolution of dispute by an impartial (Equality) without unnecessary delay or expenses;
- (b) The parties should be free to agree how their dispute are resolved, subject only to such safeguard as are necessary in the public interest.
- (c) In matters governed by the part the court should not intervene except as provided by this part.

## Arbitration Act - 1996 S.9

- Where a parties to ignore an arbitration clause agreed in a contract, the court in which he or she is trying to make the claim will order a "stay" of proceedings to that matters may be referred to arbitration as agreed in the contract.



## Arbitration Act - Section 18

The parties are free to agree what is to happen in the event of a failure of the procedure for the appointment of the arbitral tribunal. There is no failure if an appointment is duly made under Section 17 (Power in case of default to appoint sole arbitrator), unless that appointment is set aside.

(2) Mediation :- Parties in a dispute may refer their dispute to an independent third party who will act as go-between

Mediation involves an important third party who listens & directs discussion but does not suggest outcomes.

The mediator will help the parties to solve their dispute.



③ Conciliation:- Similar to the mediation but the Chaired Conciliator may suggest a way to settle. If parties is litigation refuse an offer of conciliation without good reason that even if they win their case, the Judge can refuse to award them some or all their legal cost.

- Conciliation is not binding.

④ Negotiation:- Negotiation requires parties to bargain without outside assistance exchanging compromises to reach a solution. In this approach parties can begin bargaining discussion at the beginning.

- Like mediation settlement discussion within a negotiation context are controlled entirely by the parties.

## "Advantages of ADR"

- (1) It is usually faster & less costly.
- (2) People have a chance to tell their story as they see it.
- (3) It is more flexible & responsive to the individual needs of the people involved.
- (4) It is more informal.
- (5) The parties' involvement in the process creates great commitment to the result so that compliance is more likely.
- (6) The confidential nature of the process.
- (7) ADR is more likely to preserve goodwill or at least not.



## "Disadvantages of ADR"

- (1) There is no guaranteed resolution. With the exception of arbitration alternative dispute resolution processes do not always lead to a resolution.
- (2) Arbitration decisions are final. With very few exceptions, the decision of a neutral arbitrator cannot be appealed. With being fraud an obvious exception.
- (3) The parties pursuing ADR must be careful not to let a statute of limitation run while a dispute is in any ADR process.
- (4) Non-binding arbitration. Sometimes the court may order non-binding or Judicial Arbitration.
- (5) May have no choice often the contract is dispute contains a broadly worded mandatory arbitration clause.