

Internal Assessment Test – 2

Sub: Estimation & Valuation

Code: 10CV73

Date: 08/11/2017

Duration: 90 mins

Max Marks: 50

Sem: VII

Sections: CV (A & B)

Answer all questions. Question 5 is Compulsory. Good luck!

1. Prepare a detailed rate analysis for the following items of works: (i) Ashlar stone masonry for super structure in CM 1:3 (ii) R C C 1:2:4 roof slab with 1.5% steel

10 CO2

or

2. Prepare a detailed rate analysis for the following items of works: (i) Brick masonry for super structure in CM 1:4 (ii) R C C 1:1.5:3 for beams and columns with 1.5% steel

10 CO2

3. Prepare a detailed estimate for the septic tank shown in **Figure 1** for the following items of works (i) Earth work excavation in hard gravel @ Rs 60 per Cu.m (ii) Foundation bed concrete and floor concrete in CC1:3:6 @ Rs 2200 per Cu.m (iii) Roof covering slab and baffle wall with precast RCC slab in CC 1:2:4 @ Rs 300 per Sq.m

15 CO1

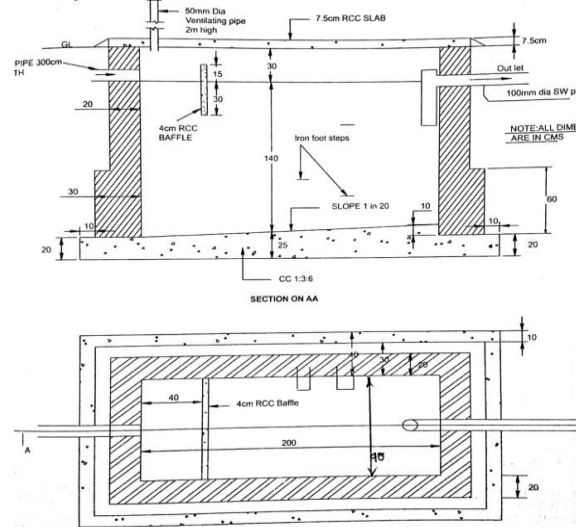


Figure 1

or

4. Prepare a detailed estimate for the septic tank shown in **Figure 2** for the following items of works (i) Earth work excavation in hard gravel @ Rs 60 per Cu.m (ii) Foundation bed concrete and floor concrete in CC1:3:6 @ Rs 2200 per Cu.m (iii) Roof covering slab with precast RCC slab in CC 1:2:4 @ Rs 300 per Sq.m.

15 CO1

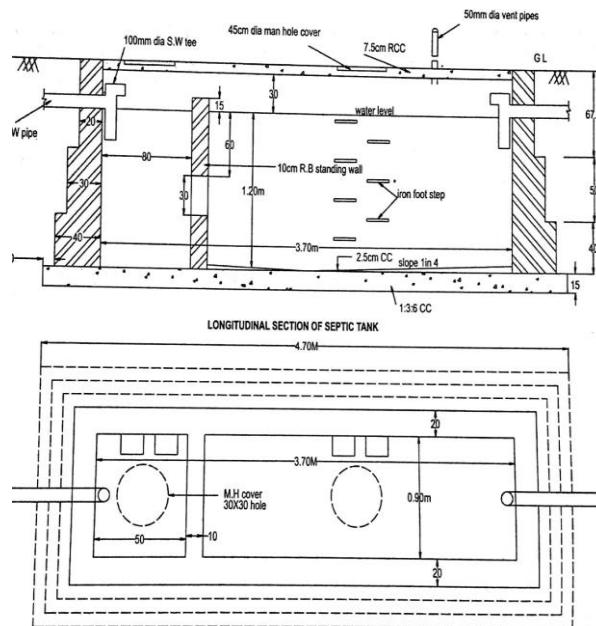


Figure 2

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- 5 Prepare a detailed estimate for the residential building shown in **Figure 3** below for the following items of works: (i) Earth work excavation @ Rs 100 per Cu.m (ii) Size stone masonry in CM 1:4 @ Rs 2000 per Cu.m (iii) RCC roof concrete in 1:2:4 @ Rs 4000 per Cu.m

25 CO1

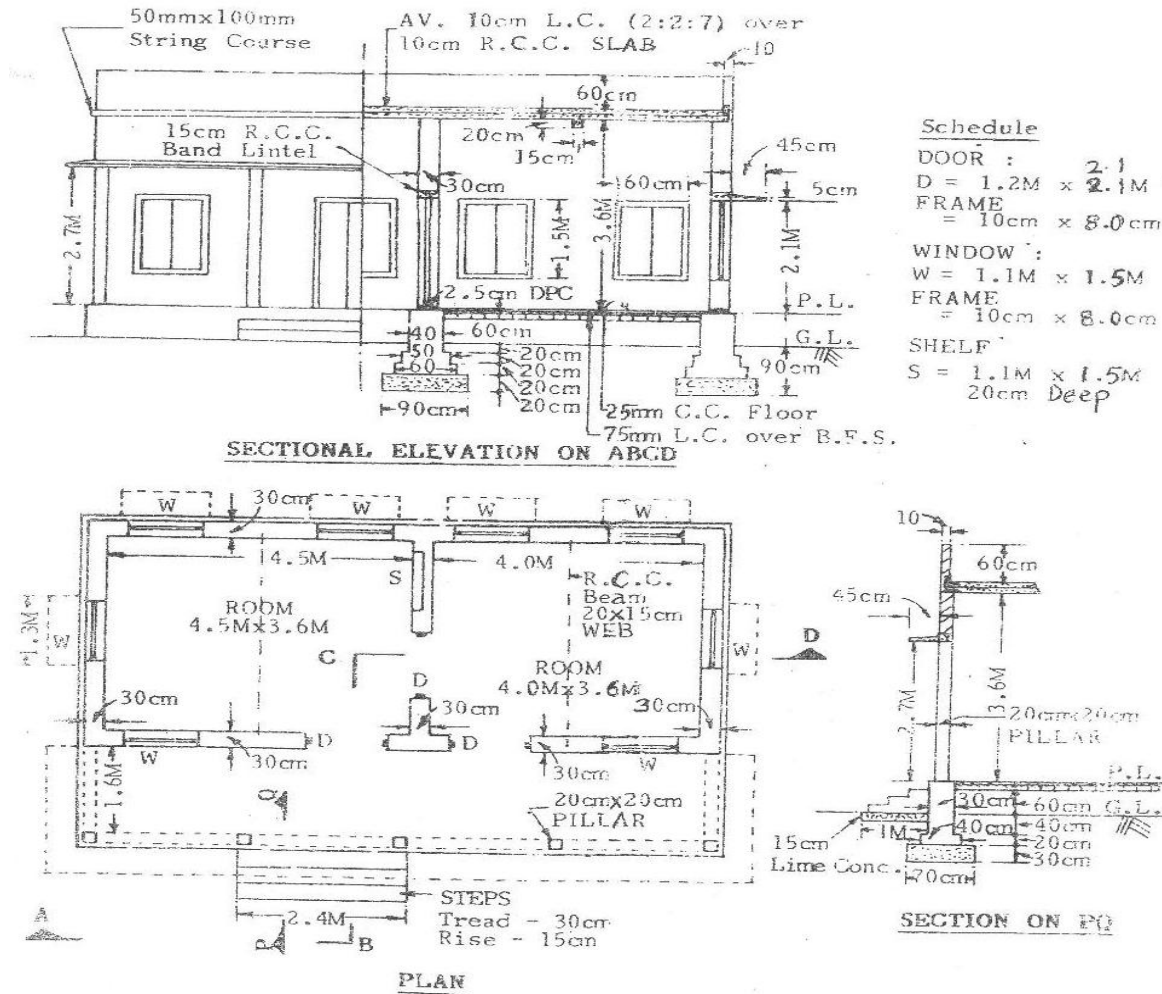


Figure 3

CCI

CI

HOD

SOLUTION

Date: 04/11/2017

Duration: 90 mins

Max Marks: 50

Sem: VII

1 (i) **Solution:**we consider 10 Cu.m for analysis.

Calculation of Materials:

Size Stones = 12.5 Cu.m

Volume of dry mortar = 2.50 Cu.m

Sum of proportions = 1+3 = 4

Cement = $\frac{2.50}{1+3} = \frac{2.50}{4} = 0.63 \text{ Cu.m} = \frac{0.63}{0.035} = 17.86 \text{ bags} = 18 \text{ bags}$

Sand = $(3) \left(\frac{2.50}{1+3} \right) = 3 * \frac{2.50}{4} = 1.88 \text{ Cu.m}$

Sl.No	Description of work	Qty	Unit	Rate per Unit (Rs)	Amount (Rs)
1	Materials Only				
	a) Cement	18	Bags	Rs 450	8100.00
	b) Sand (FA)	1.88	Cu.m	Rs 2600	4888.00
	c) Size Stones	12.50	Cu.m	Rs 600	7500.00
	d) Contingencies			Lump sum	3000.00
2	Labour only				
	a) Head Mason	0.50	No	Rs 500	250.00
	b) Mason	25.00	No	Rs 500	12500.00
	c) Mazdoor	35.00	No	Rs 300	10500.00
	d) Bhisti	4.00	No	Rs 250	1000.00
				Total	47738.00
				Add water charges @3%	1432.14
				Add 10% for contractor's profit	4773.80
				Grand Total	53943.94

Rate per Cu.m = (Rs 53943.94/10) = Rs 5394.39 = Rs 5394.

(ii) **Solution:**we consider 10 Cu.m for analysis.

Sl.No	Description of work	Qty	Unit	Rate per Unit (Rs)	Amount (Rs)
1	Materials Only				
	a) Cement	63	Bags	Rs 450	28350.00
	b) Sand (FA)	4.38	Cu.m	Rs 2600	11388.00
	c) Coarse Agg (CA)	8.76	Cu.m	Rs 1800	15768.00
	d) Steel @ 1.5%	1179	Kg	Rs 64	75456.00
	e) Binding wire	11.79	Kg	Rs 64	754.56
				Lump sum	3000.00
2	Labour only				
	a)Head Mason	0.50	No	Rs 500	250.00
	b) Mason	3.00	No	Rs 500	12500.00
	c) Mazdoor	18.00	No	Rs 300	10500.00
	d)Bhisti	4.00	No	Rs 250	1000.00
				Total	158966.56
				Add water charges @3%	4769.00
				Add 10% for contractor's profit	15896.66
				Grand Total	179632.22

Rate per Cu.m = (Rs 179632.22/10) = Rs 17963.22 = Rs 17963.

2. (i) **Solution:**we consider 10 Cu.m for analysis.
we consider 10 Cu.m for analysis. **Standard size of 1 brick is 20x10x10cm.**

Calculation of Materials:

$$\text{Number of bricks} = \frac{10}{(0.2 \times 0.1 \times 0.1)} = 5000 \text{ No.}$$

$$\text{Volume of bricks without mortar} = 5000 \times 0.19 \times 0.09 \times 0.09 = 7.70 \text{ Cu.m}$$

$$\text{Volume of wet mortar} = 10.00 - 7.70 = 2.30 \text{ Cu.m}$$

Add 35% extra to wet mortar in order to get volume of dry mortar.

$$\text{Volume of dry mortar} = 1.45(2.30) = 3.34 \text{ Cu.m}$$

$$\text{Sum of proportions} = 1+4 = 5$$

$$\text{Cement} = \frac{3.34}{1+4} = \frac{3.34}{5} = 0.67 \text{ Cu.m} = \frac{0.67}{0.035} = 19.06 \text{ bags} = 19 \text{ bags}$$

$$\text{Sand} = (4) \left(\frac{3.34}{1+4} \right) = 4 * \frac{3.34}{5} = 2.67 \text{ Cu.m.}$$

Sl.No	Description of work	Qty	Unit	Rate per Unit (Rs)	Amount (Rs)
1	Materials Only				
	a) Cement	19	Bags	Rs 450	8550.00
	b) Sand (FA)	2.67	Cu.m	Rs 2600	6942.00
	c) Bricks	5000	No	Rs 7	35000.00
	d) Contingencies			Lump sum	3000.00
2	Labour only				
	a) Head Mason	0.50	No	Rs 500	250.00
	b) Mason	8.00	No	Rs 500	4000.00
	c) Mazdoor	15.00	No	Rs 300	4500.00
	d) Bhisti	2.00	No	Rs 250	500.00
				Total	62742.00
				Add water charges @ 3%	1882.26
				Add 10% for contractor's profit	6274.20
				Grand Total	70898.46

Rate per Cu.m = (Rs 70898.46/10) = Rs 7089.85 = Rs 7090.

(ii) **Solution:**we consider 10 Cu.m for analysis.

Sl.No	Description of work	Qty	Unit	Rate per Unit (Rs)	Amount (Rs)
1	Materials Only				
	a) Cement	80	Bags	Rs 450	36000.00
	b) Sand (FA)	4.17	Cu.m	Rs 2600	10842.00
	c) Coarse Agg (CA)	8.34	Cu.m	Rs 1800	15012.00
	d) Steel @ 1.5%	1179	Kg	Rs 64	75456.00
	e) Binding wire	11.79	Kg	Rs 64	754.56
				Lump sum	3000.00
2	Labour only				
	a) Head Mason	0.50	No	Rs 500	250.00
	b) Mason	3.00	No	Rs 500	12500.00
	c) Mazdoor	18.00	No	Rs 300	10500.00
	d) Bhisti	4.00	No	Rs 250	1000.00
				Total	62742.00
				Add water charges @ 3%	627.42
				Add 10% for contractor's profit	6274.42
				Grand Total	186805.46

Rate per Cu.m = (Rs 186805.46/10) = Rs 18680.55 = Rs 18681.

3. Solution: (I) QUANTITY ESTIMATE:

Sl.No	Description of work	No	L (m)	B (m)	D (m)	Unit	Qty	Total
1.	Earth work excavation	1	2.80	1.70	1.95	Cu.m	9.28	9.28
2	CC1:3:6 works							
	(i) Excavation	1	2.80	1.70	0.20	Cu.m	0.95	1.04
	(ii) Floor	1	2.00	0.90	0.05	Cu.m	0.09	
3	Roof covering slab and baffle wall							
	(i) Roof slab	1	2.40	1.30		Sq.m	3.12	3.57
	(ii) Baffle wall	1	1.00		0.45	Sq.m	0.45	

(II) COST ESTIMATE:

Sl.No	Description of work	Qty	Unit	Rate per Unit (Rs)	Amount (Rs)
1	Earth work excavation	9.28	Cu.m	60	556.80
2	CC1:3:6 works	1.04	Cu.m	2200	2288.00
3	Roof covering slab and baffle wall	3.57	Sq.m	300	1071.00
				Total	3915.80
				Add water charges @3%	117.47
				Add contingencies and W/E @ 5%	195.79
				Add 10% for contractor's profit	391.58
				Grand Total	4503.17

The final cost is Rs 4503.17 = Rs 4503.

4. Solution: (I) QUANTITY ESTIMATE:

Sl.No	Description of work	No	L (m)	B (m)	D (m)	Unit	Qty	Total
1.	Earth work excavation	1	4.70	1.90	1.725	Cu.m	15.40	15.40
2	CC1:3:6 works							
	(iii) Excavation	1	4.70	1.90	0.15	Cu.m	1.34	1.42
	(iv) Floor	1	3.70	1.90	0.025	Cu.m	0.08	
3	Roof covering slab							
	(iii) Roof slab	1	3.90	1.10		Sq.m	4.29	4.29

(II) COST ESTIMATE:

Sl.No	Description of work	Qty	Unit	Rate per Unit (Rs)	Amount (Rs)
1	Earth work excavation	15.40	Cu.m	60	924.00
2	CC1:3:6 works	1.42	Cu.m	2200	3124.00
3	Roof covering slab and baffle wall	4.29	Sq.m	300	1287.00
				Total	5335.00
				Add water charges @3%	160.05
				Add contingencies and W/E @ 5%	266.75
				Add 10% for contractor's profit	533.50
				Grand Total	6135.25

The final cost is Rs 6135.25 = Rs 6135.

5. Solution: (I) QUANTITY ESTIMATE:

Sl.No	Description of work	No	L (m)	B (m)	D (m)	Unit	Qty	Total
1.	Earth work excavation							
	a)Long walls (Rooms)	2	10.00	0.90	0.90	Cu.m	16.20	31.05
	b) Short walls (Rooms)	3	3.00	0.90	0.90	Cu.m	7.29	
	c) pillars	5	0.70	0.70	0.90	Cu.m	2.21	
	d)Dwarf wall (Shorter side)	2	1.05	0.70	0.90	Cu.m	1.32	
	e))Dwarf wall (longer side)	1	6.40	0.70	0.90	Cu.m	4.03	
2	Size Stone masonry in CM 1:4							
	Bottom Most Course							20.66
	a)Long walls (Rooms)	2	9.70	0.60	0.20	Cu.m	2.33	
	b) Short walls (Rooms)	3	3.30	0.60	0.20	Cu.m	1.19	
	Middle Course							
	a)Long walls (Rooms)	2	9.60	0.50	0.20	Cu.m	1.92	
	b) Short walls (Rooms)	3	3.40	0.50	0.20	Cu.m	1.02	
	c) pillars	5	0.40	0.40	0.20	Cu.m	0.16	
	d)Dwarf wall (Shorter side)	2	1.40	0.40	0.20	Cu.m	0.22	
	e))Dwarf wall (longer side)	1	7.90	0.40	0.20	Cu.m	0.63	
	Top Most Course							
	a)Long walls (Rooms)	2	9.50	0.40	0.80	Cu.m	6.08	
	b) Short walls (Rooms)	3	3.50	0.40	0.80	Cu.m	3.36	
	c) pillars	5	0.30	0.30	1.00	Cu.m	0.45	
	d)Dwarf wall (Shorter side)	2	1.50	0.30	1.00	Cu.m	0.90	
	e))Dwarf wall (longer side)	1	8.00	0.30	1.00	Cu.m	2.40	
3	Roof slab							
	Roof slab	1	9.70	6.00	0.10	Cu.m	5.82	5.82

(II) COST ESTIMATE:

Sl.No	Description of work	Qty	Unit	Rate per Unit (Rs)	Amount (Rs)
1	Earth work excavation	31.05	Cu.m	100	3105.00
2	Size Stone masonry in CM 1:4	20.66	Cu.m	2000	41320.00
3	Roof slab	5.82	Cu.m	4000	23280.00
				Total	67705.00
				Add water charges @3%	2031.15
				Add contingencies and W/E @ 5%	3385.25
				Add 10% for contractor's profit	6770.50
				Grand Total	79891.90

The final cost is Rs 79891.90 = Rs 79892.