CMR INSTITUTE OF TECHNOLOGY

USN

Internal Assesment-1 – September 2016

Sub:	Estimation & Valuation					Code:	10CV73
Date:	07/09/16	Duration:	90 mins	Max Marks: 50	Sem: 7	Branch:	CV

Note: **Answer to the point. Sketch figures wherever necessary**

Assume any missing data suitably.

Answer all questions:

1 Write general principles of units of measurement, and give ten examples. **10 marks**

2. The details of a residential building are as shown in Fig.1. Work out the **quantities and cost** of the following items of work, by centre-line method:

a. Earth work in excavation for foundation consider 75% quantity @ Rs 200/m^3 & rest @ Rs 400/m^3.
b. PCC bed concrete 1:4:8 at Rs 3800/m^3.
c. Size stone masonry in CM 1:6 for foundation and basement at Rs 3000/m^3.
d. First class brickwork in superstructure in CM 1:6 at RS 3600/m^3. (including parapet walls)

If the estimated cost is 80% of gross cost determine the gross cost. **40 marks**

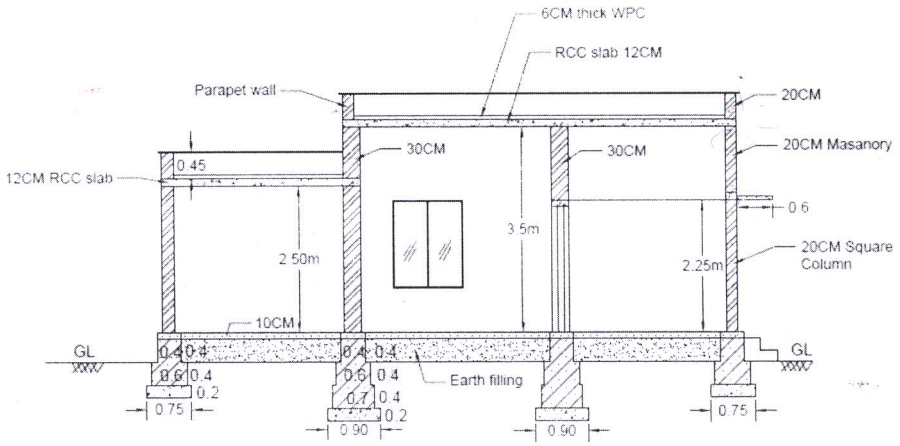

Fig-1(b). SECTION ABCD

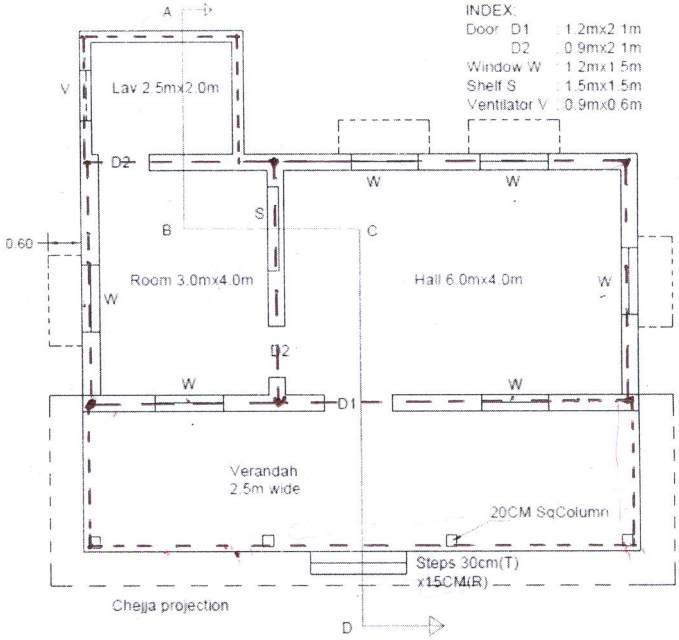

Fig-1(a). PLAN

Solution-2

a) Centre line length of all 30 cm walls:

$$L_{30cm} = \left(\frac{0.3}{2} + 3 + 0.3 + 6 + \frac{0.3}{2}\right)2 + 3\left(\frac{0.3}{2} + 4 + \frac{0.3}{2}\right)$$

$$L_{30cm} = 19.2 + 12.9$$

$$\boxed{L_{30cm} = 32.1\,m.}$$

b) Centre line length of all 20 cm walls of Lavatory portion

$$L_{20cm\,lavatory} = 2\left(\frac{0.3}{2} + 2 + \frac{0.2}{2}\right) + (2.5 + 0.2)$$

$$= 4.5 + 2.7$$

$$\boxed{L_{20_{lavatory}} = 7.2m}$$

c) Centre line length of all 20 cm verandah portion:

$$L_{20cm\,verandah} = 2\left(\frac{0.3}{2} + 2.5 - \frac{0.2}{2}\right) + (9.6 + 0.1)$$

$$= 5.1 + 9.7$$

$$\boxed{L_{20cm\,verandah} = 14.8m}$$

d) Number of Junctions:

30 to 30 cm walls = 2

30 to 20 cm Lavatory = 2

30 to 20 cm verandah = 2

Item no	Description	No	L(m)	B(m)	D(m)	Quantity (m^3)	Explanatory note (m)
a)	Earthwork in excavation for foundation						
	(i) 30 cm walls	1	31.2	0.9	1	28.08	$L = 32.1 - \left(2 \times \frac{0.9}{2}\right)$ $L = 31.2\ m$
	(ii) 20 cm walls Lavatory	1	6.3	0.75	0.6	2.835	$L = 7.2 - \left(2 \times \frac{0.9}{2}\right)$ $L = 6.3\ m$
	(iii) 20cm walls verandah	1	13.9	0.75	0.6	6.255	$L = 14.8 - \left(2 \times \frac{0.9}{2}\right)$ $L = 13.9\ m$
				Total		37.17	
b)	PCC bed concrete						
	(i) 30 cm walls	1	31.2	0.9	0.2	5.616	same as above
	(ii) 20cm wall (Lavatory)	1	6.5	0.75	0.2	0.975	$L = 7.2 - \left(2 \times \frac{0.7}{2}\right)$ $L = 6.5m$
	(iii) 20cm wall (verandah)	1	14.1	0.75	0.2	2.115	$L = 14.8 - \left(2 \times \frac{0.7}{2}\right)$ $L = 14.1$
				Total		8.706	
c)	SSM for foundation and basement.						
	(i) 30 cm walls:						$L = 32.1 - \left(2 \times \frac{0.7}{2}\right)$ $L = 31.4m$
	a) 1st footing	1	31.4	0.7	0.4	8.792	$L = 32.1 - \left(2 \times \frac{0.6}{2}\right)$
	b) 2nd footing	1	31.5	0.6	0.4	7.56	$L = 31.5m$
	c) Plinth	1	31.7	0.4	0.4	5.072	$L = 32.1 - \left(2 \times \frac{0.4}{2}\right)$ $L = 31.7m$
	(ii) 20cm Lavatory						
	a) 1st footing	1	6.6	0.6	0.4	1.584	$L = 7.2 - \left(2 \times \frac{0.6}{2}\right)$ $L = 6.6m$
	b) Plinth	1	6.8	0.4	0.4	1.088	$L = 7.2 - \left(2 \times \frac{0.4}{2}\right)$ $L = 6.8$

Item no	Description	No	L(m)	B(m)	D(m)	Quantity (m^3)	Explanatory note
	(iii) 20 cm wall Verandah						$L = 14.8 - \left(2 \times \frac{0.6}{2}\right)$
	a) 1ST footing	1	14.2	0.6	0.4	3.408	$L = 14.2\,m$
	b) Plinth	1	14.4	0.4	0.4	2.304	$L = 14.8 - \left(2 \times \frac{0.4}{2}\right)$ $L = 14.4m$
d)	First class brickwork in superstructure						$L = 32.1 - \left(2 \times \frac{0.3}{2}\right)$
	(i) 30cm wall	1	31.8	0.3	3.5	33.39	$L = 31.8m$
	(ii) 20cm wall (Lav.)	1	6.9	0.2	2.5	3.45	$L = 7.2 - \left(2 \times \frac{0.3}{2}\right)$ $L = 6.9m$
	(iii) Columns	4	0.2	0.2	2.25	0.36	
→	20cm masonry above column Lintel	1	14.5	0.2	1.1 (3.5 − 2.25 − 0.15)	3.19	$L = 14.8 - \left(2 \times \frac{0.3}{2}\right)$ $L = 14.5\,m$
→	Parapet wall above room, Hall and verandah.	1	33.2	0.2	0.45	2.988	$L = 2\left(\frac{0.2}{2} + 0.1 + 4 + 0.3 + 2.5 - \frac{0.2}{2}\right) + 2\left(\frac{0.2}{2} + 0.1 + 3 + 0.3 + 6 + 0.1 + \frac{0.2}{2}\right)$ $L = 13.8 + 19.4$ $L = 33.2\,m$
→	Parapet wall above Lavatory	1	6.9	0.2	0.45	0.621	$L = (2 \times 2) + (0.1) + 2.5 + 0.1$ $L = 6.7 + 0.1 + 0.1$ $L = 6.9m$
				Total		43.999	
	Deductions for doors, windows, ventilator, shelve:						
	(i) Doors D_1	1	1.2	0.3	2.1	−0.756	
	D_2	2	0.9	0.3	2.1	−1.134	
	(ii) Windows W	6	1.2	0.3	1.5	−3.24	
	(iii) Ventilator V	1	0.9	0.2	0.6	−0.108	
	(iv) Shelve S	1	1.5	0.2	1.5	−0.45	
				Total		−5.688	

Item no	Description	No	L(m)	B(m)	D(m)	Quantity	Explanatory note
	Lintel above doors, windows, ventilators, shelves:						
	(i) Doors D_1	1	1.5	0.3	0.15	-0.0675	Taking bearing length 15cm
	D_2	2	1.2	0.3	0.15	-0.108	
	(ii) windows W	6	1.5	0.3	0.15	-0.405	
	(iii) Ventilator V	1	1.2	0.2	0.15	-0.036	
	(iv) Shelves S	1	1.2	0.2	0.15	-0.036	
					Total	-0.6615	
					Grand Total	37.64	

Abstract of Estimate form.

Item No.	Description	quantity	unit	Rate	Per	Amount
a)	Earth work in excavation for foundation					
	(i) 75% of 37.64	28.23 m^3	m^3	200	m^3	5,646/-
	(ii) 25% of 37.64	9.41 m^3	m^3	400	m^3	3,764/-
(b)	PCC Bed concrete	8.706 m^3	m^3	3800	m^3	33,082.8/-
(c)	SSM for foundation and basement	29.808	m^3	3000	m^3	89,424.00/-
(d)	1st class brick-work in superstructure.	37.649	m^3	3600	m^3	135,536.4/-
				Total	⇒	267,453.2/-

The estimated cost Rupees 267,453.2 is 80% of the gross cost,

$\therefore$ Gross cost = $\frac{267,453.2}{0.8}$

Gross Cost =	334316.5/-