Course Code: 20CE0121 **R20**

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
Siddharth Nagar, Narayanavanam Road – 517583
QUESTION BANK (DESCRIPTIVE)

Subject with Code: Estimation,Costing and Valuation(20CE0121) **Course & Branch**: B.Tech - CE

Regulation: R20 **Year & Sem:** III-B.Tech&I-Sem

UNIT –I
ESTIMATING AND ESTIMATE OF BUILDINGS

1	What is the importance of estimating and write the standard units for various items of work in a residential building?	**[L1][CO1]**	**[12M]**
2	Briefly explain the different types of estimates discussing when each one is preferred.	**[L1][CO1]**	**[12M]**
3	List out the main items of building work and explain briefly	**[L1][CO1]**	**[12M]**
4.	What are the different methods of estimate? Explain long wall and short wall method and centre line method in detail.	**[L1][CO1]**	**[12M]**
5.	A person constructs a building of a plinth area equal to 160 sq.m. on a plot of land in a certain locality at a rate of Rs. 25,50,000/- . The height of the building from ground level to the top of roof is 3.10 m and parapet wall of height equal to 75 cm is constructed on the terrace. Determine the cost of a similar building of a plinth area equal to 140 sq.m. is to be constructed in the same locality by plinth area rate and volume rate method.	**[L1][CO1]**	**[12M]**
6	Prepare a preliminary estimate of a residential building project with a total plinth area of all buildings of 1750 sq.m. for following given data Plinth area rate ---------- Rs. 12,500/- per sq. m. Extra for special Architectural treatment ---------- 1.5% of the building cost Extra for Water supply and Sanitary installations ---- 5% of the building cost Extra for internal installations ---------- 12% of the building cost Extra for services ---------- 7% of the building cost Contingencies---------- 3% of the building cost Supervision charges_____ 5% of the building cost	**[L1][CO1]**	**[12M]**
7	Estimate the following items for the plan and section given in Fig. 1 Use long wall and short wall method. (a) Earthwork for excavation (b) I class brickwork for sub structure (c) Inside plastering in CM (1 : 5) with 12 mm thickness. (d) Cement concrete flooring in cc (1:1:2) with 20 mm thick	**[L2][CO1]**	**[12M]**

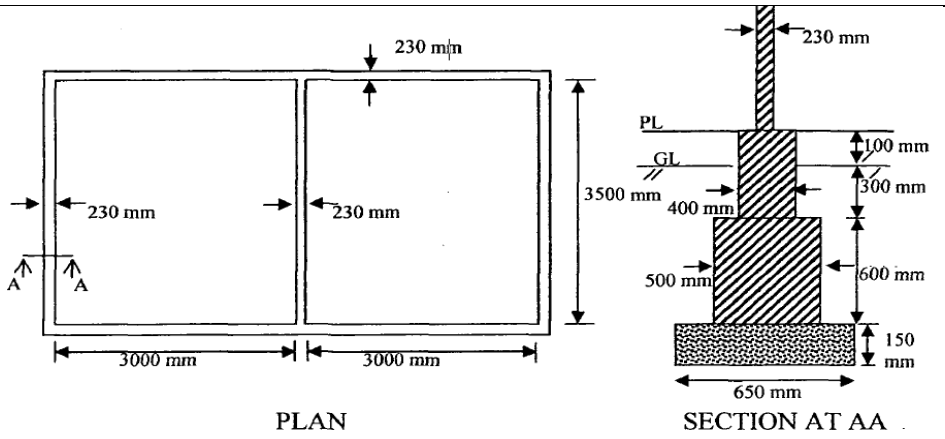


Fig. 1

8	Calculate the quantities of the following items for the building shown in fig.2 using Longwall and short wall method. (a) Earth work in excavation (b) PCC (1: 5: 10) below the foundation (c) Brick work in foundation and plinth (d) Damp Proof Course (e)Brick masonry in CM (1:6) for super structure.	**[L2][CO1]**	**[12M]**

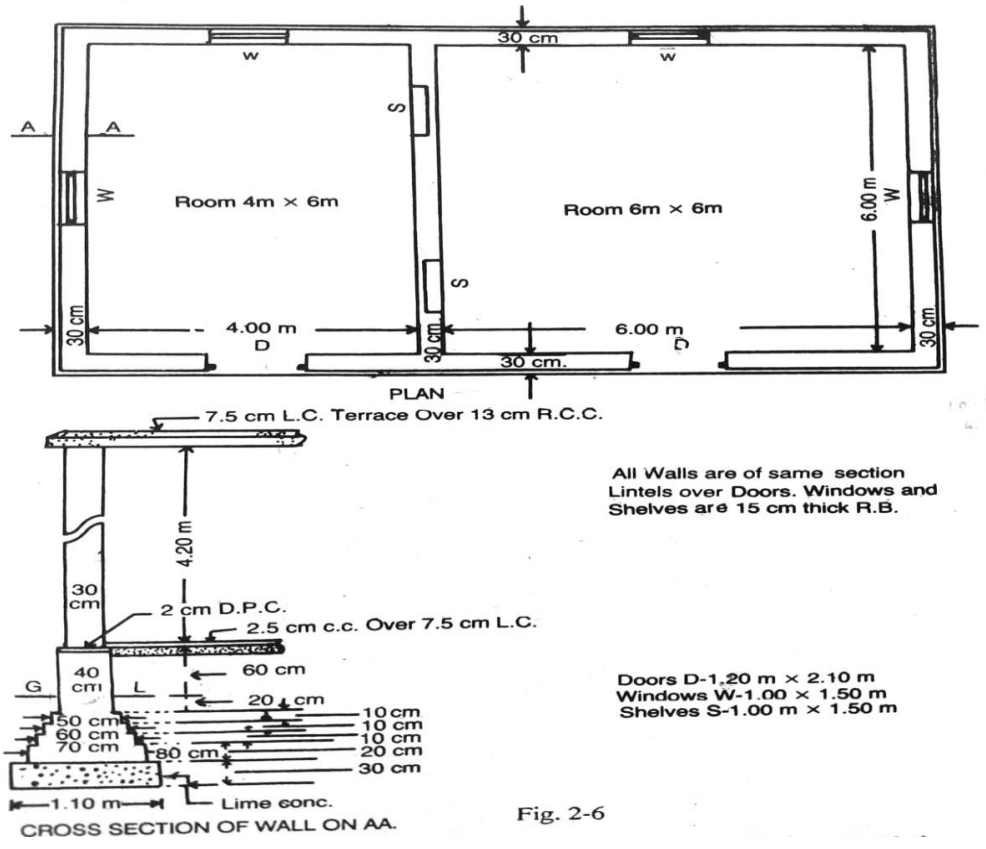
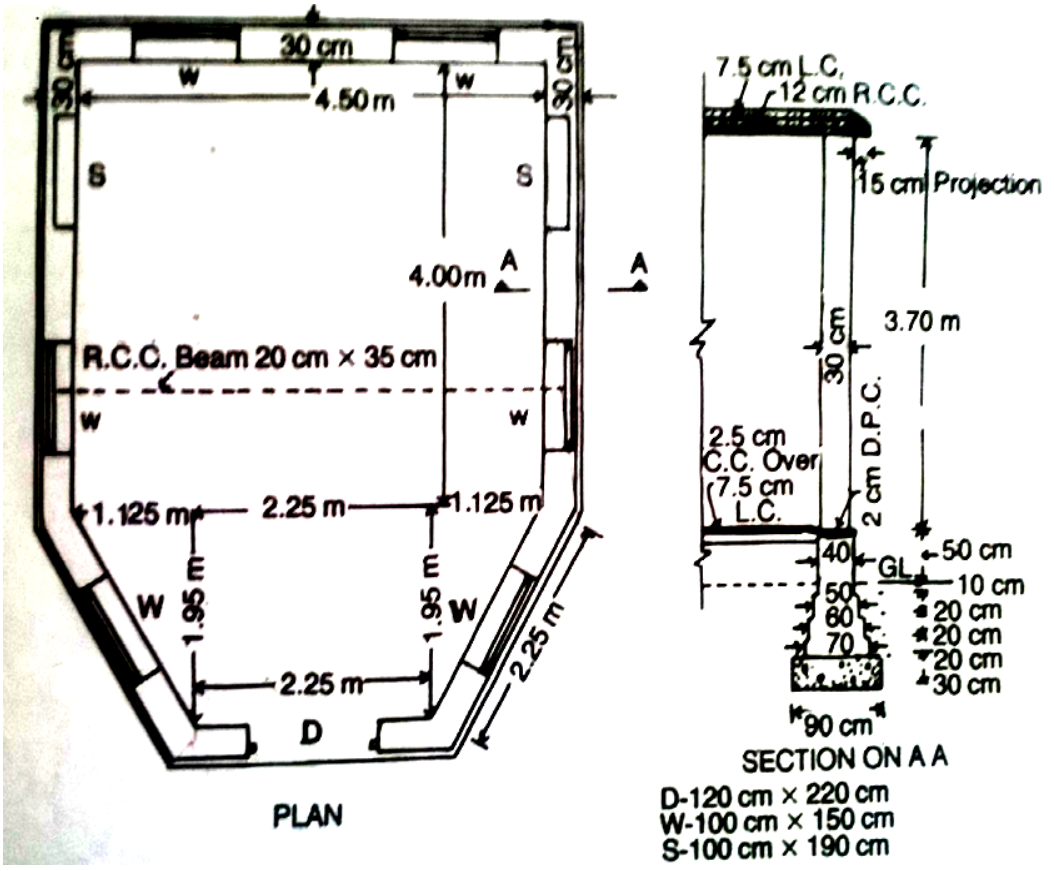


Fig. 2-6

Fig. 2

9	Estimate the detailed quantity for the following building from the given plan and cross section as shown in Fig.3 by using center line method. a) Earth work excavation. b) Brick work in CM (1:4) for substructure up to plinth level. c) R.C.C. slab with (1:1.5:3) d) Inside Plastering in cm (1:5) with 12 mm thick.	**[L2][CO1]**	**[12M]**

Fig. 3



10	Estimate the quantities of the building items of a hexagonal room from the given plan and section as shown in Fig.4 by using center line method. a) Earthwork excavation for foundation b) I-Class brick work for super structure c) Plastering in CM (1:5), 20 mm thick for inside walls. d) Marble flooring over cc bed with 20 mm thick	[L3][CO1]	**[12M]**

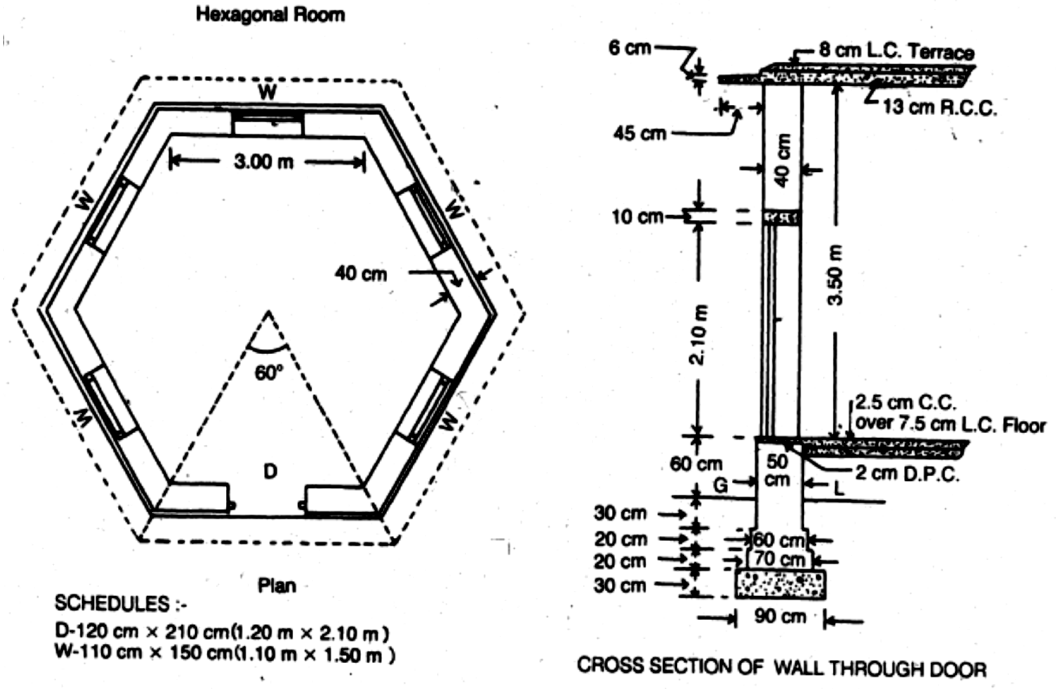


Fig. 4

UNIT –II
ROAD ESTIMATING AND EARTH WORK FOR CANALS

1 Define *Lead* and *Lift.* Write a detailed note on different methods for computation of earth work excavation in road embankments. **[L2][CO2]** **[12M]**

2 Calculate the quantity of earth work by using Mid Sectional Area Method, Mean Sectional Area Method and Prismoidal Formula Method for 450 metre length for a portion of a road in an uniform ground heights of banks at the two ends being 1.50 m and 2.10 m. The formation width is 12 metre and side slopes 2:1(Horizontal: Vertical). Assume that there is no transverse slope. **[L2][CO2]** **[12M]**

3 Reduced level (RL) of ground along the centre line of a proposed road from chainage 10 to chainage 20 are given below. The formation level at the 10th chainage is 107.00 m.The downward Gradient as shown in below table. Formation width of road is 10 m and side slopes banking are 2:1 (H:V), the length of the chain in 30 m. Estimate the quantity of cutting and banking at the rate of Rs.220/1cum and Rs.100/1cum **[L3][CO2]** **[12M]**

Chainage	10	11	12	13	14	15	16	17	18	19	20
RL of ground	105.0	105.6	105.4	105.9	105.42	104.6	105.4	103.9	104.9	104.0	103.2
RL of formation	107										
Gradient	Downward gradient 1 in 150						Upward gradient 1 in 100				

4 Reduced level (R.L.) of ground along the centre line of a proposed road from chainage 10 to chainage 20 are given below. The formation level at the 10th chainage is 107 and road is in downward gradient of 1 in 150 up to the chainage 14 and then the gradient changes to 1 in 100 downward. Formation width of road is 10 m and side slopes of banking are 2:1 (H:V). Length of the chain is 30 m. Prepare an estimate of earth at the rate of Rs.275% cu.m. **[L3][CO2]** **[12M]**

Chainage	RL of ground (m)
10	105.00
11	105.60
12	105.44
13	105.90
14	105.42
15	104.30
16	105.00
17	104.10
18	104.62
19	104.00
20	103.30

5 Reduced level (R.L.) of ground along the centre line of a proposed road from chainage 10 to chainage 20 are given below. The formation level at the 10th chainage is 107 and road is in downward gradient of 1 in 150 up to the chainage 14 and then the gradient changes to 1 in 100 downward. Formation width of road is 10 m and side slopes of banking are 2:1 (H:V). Length of the chain is 30 m. Find the area of the side slopes and the cost of turfing the side slopes at the rate of Rs.120 per sq.m. **[L3][CO2]** **[12M]**

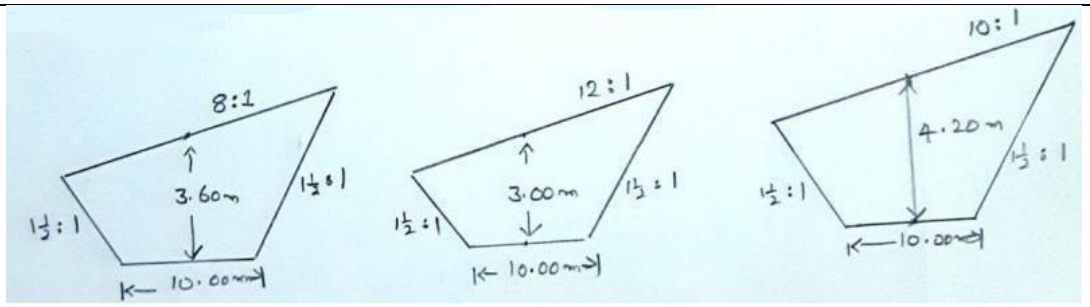
Chainage	RL of ground (m)
10	105.00
11	105.60
12	105.44
13	105.90
14	105.42
15	104.30
16	105.00
17	104.10
18	104.62
19	104.00
20	103.30

6 Estimate the cost of earthwork for a portion of road for 400 m length from the following data:- **[L3][CO2]** **[12M]**

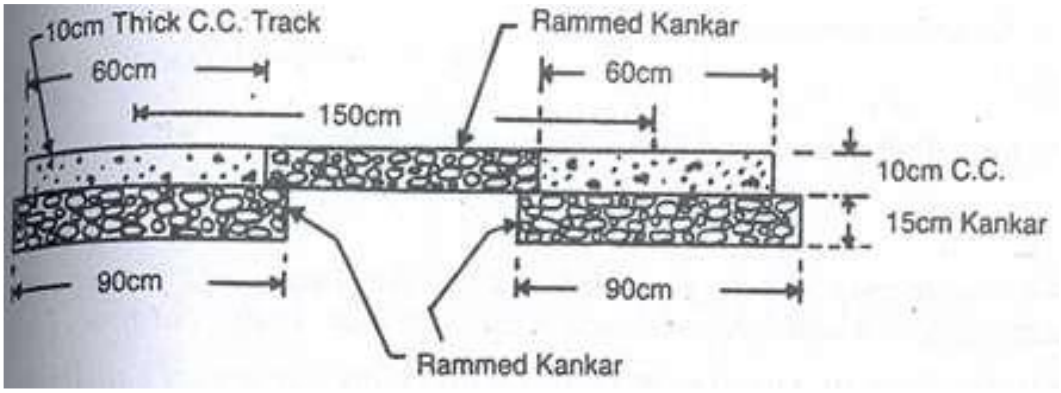
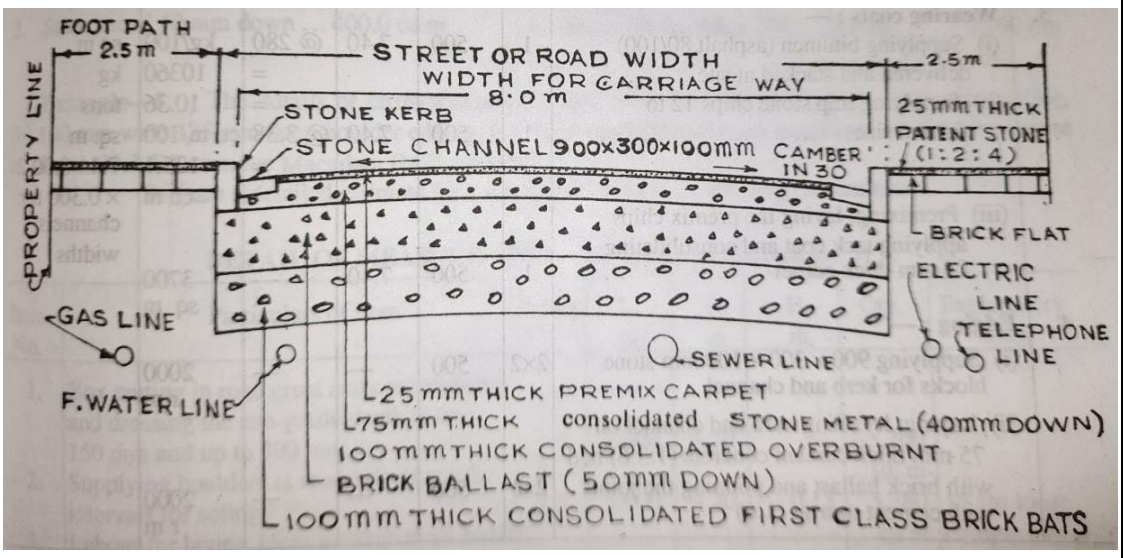
Formation width of the road is 10 m. Side slopes are 2:1 in banking 1.5 in cutting.

Station	Distance in m	RL of ground in m	RL of formation
25	1000	51.00	RL of formation is 52.00. Downward gradient of 1in 200
26	1040	50.90	
27	1080	50.50	
28	1120	50.80	
29	1160	50.60	
30	1200	50.70	
31	1240	51.20	
32	1280	51.40	
33	1320	51.30	
34	1360	51.00	
35	1400	50.60	

7 A hill road is to be constructed in side-long ground in cutting. Calculate the quantity of earthwork for two chain length in between 10th to 12th chainage, the length of chain being 30 m. The depth of cutting at the chainage 10 is 3.60 m at the centre and cross slope of ground is 8:1 (H:V). The depth of cutting at the chainage 11 is 3.00 m at the centre and cross slope of ground is 12:1 (H:V). The depth of cutting at the chainage 12 is 4.20 m. The depth of cutting at the chainage 12 is 4.20 m at the centre and cross slope of ground is 10:1 (H:V). Formation width is 10 m and side slopes of cutting 1.5:1 (H:V). Estimate cost of earthwork using *Mid-Sectional Area, Mean Sectional Area* and *Prismoidal Method* if the rate of earthwork in exaction is Rs.275%cu.m. **[L3][CO2]** **[12M]**



Section at 10th Chainage | Section at 11th Chainage | Section at 12th Chainage

8	Prepare a detailed estimate for one kilometer length of a 'cement concrete Track way ' from the given fig. 	**[L3][CO2]**	**[12M]**
9	Detailed dimensioned sketch cross-section of a city street having mettled portion of 8 m for the carriageway is shown in figure. Prepare a estimate for constructing 500 m length of this street. Indicate also quantities of materials. 	**[L3][CO2]**	**[12M]**

10	A canal is to be constructed from reservoir to agricultural field at a distance of 3 Km with a depth of 2.50 m from the ground level and side slopes of 1: 1.5. Maintain the bottom bed width of the canal throughout the length is 3.50 m and also provide banking on both left and right side of the canal at an height of 1.50 m from the ground level with the side slopes are 1: 1.5. Take banking bed width on both side is 3.50 m. Calculate the quantity of earth work on banking and cutting of the canal.	**[L3][CO2]**	**[12M]**

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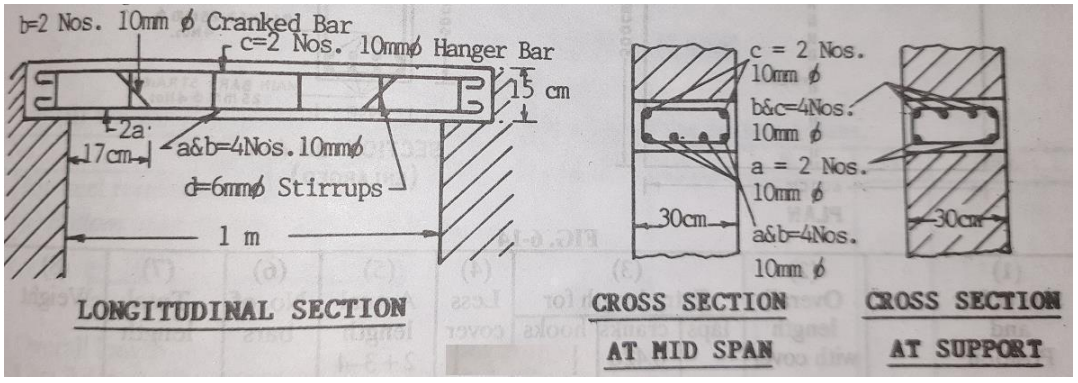
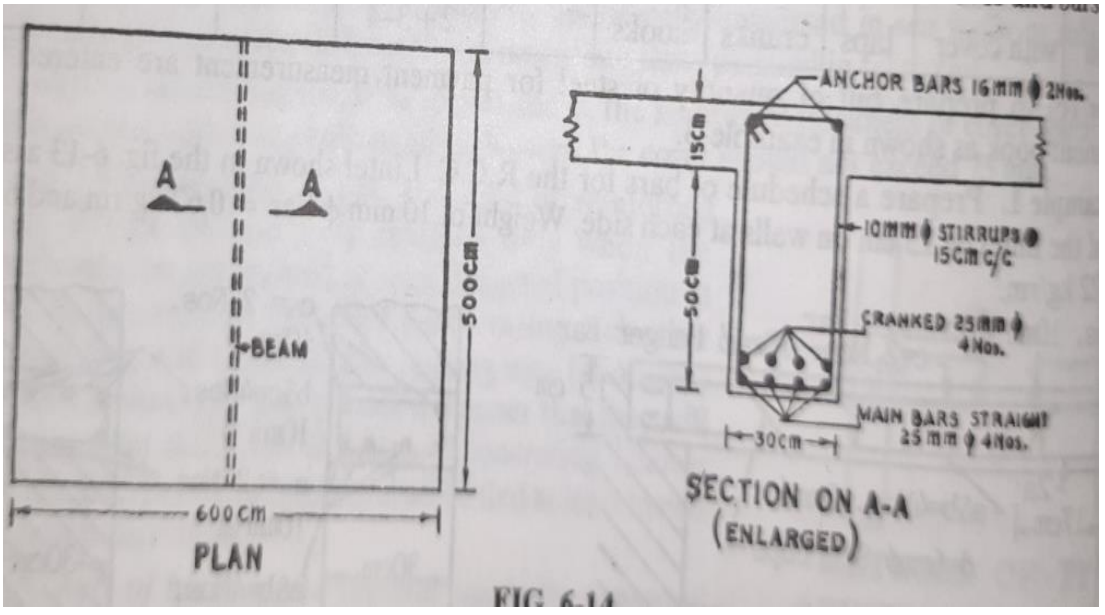
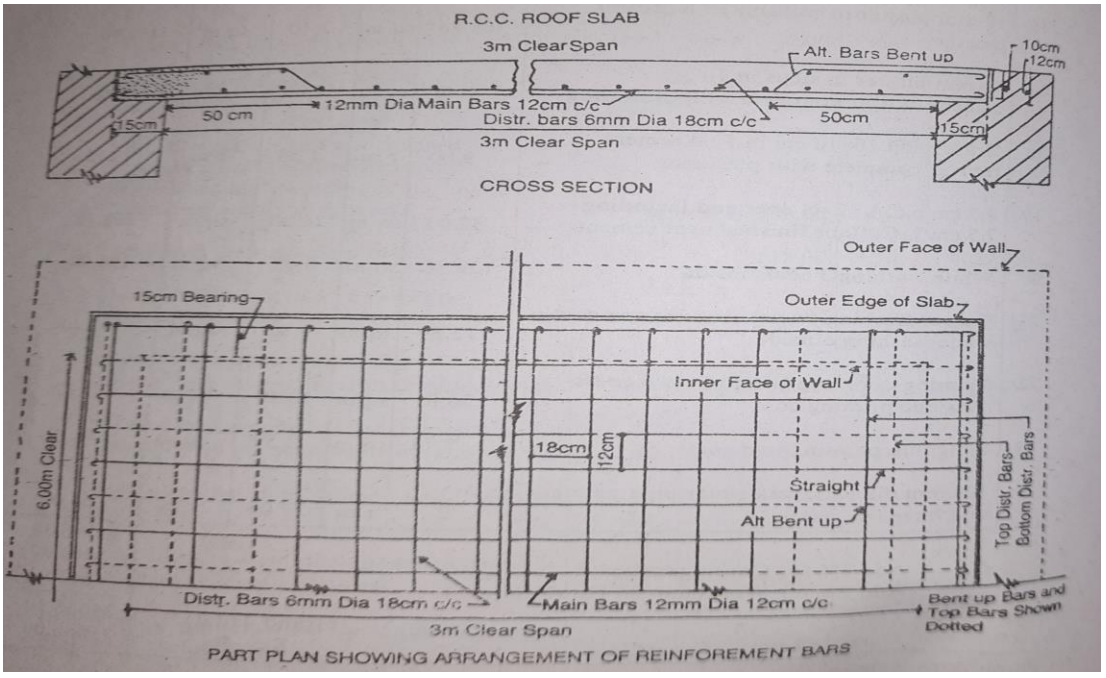
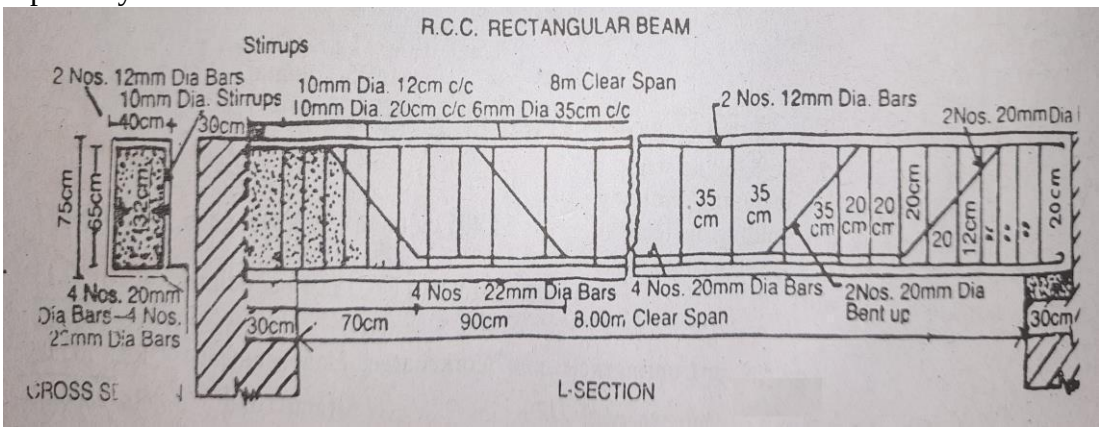
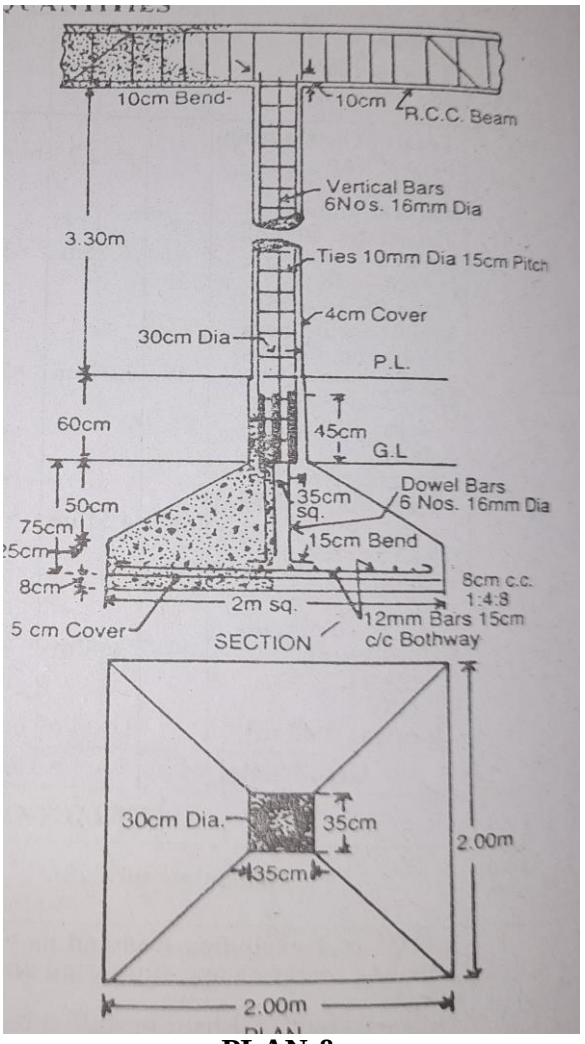
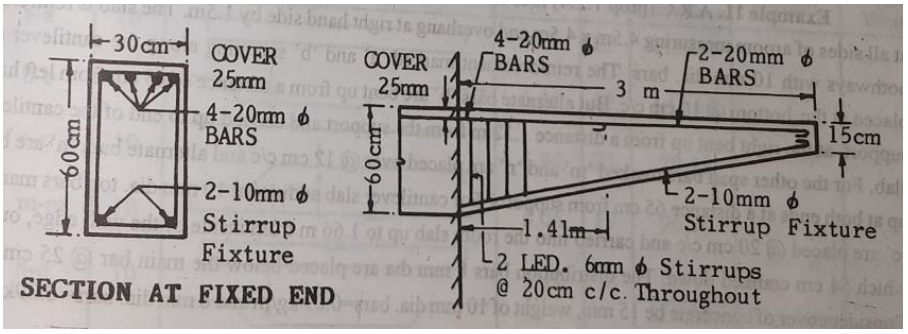
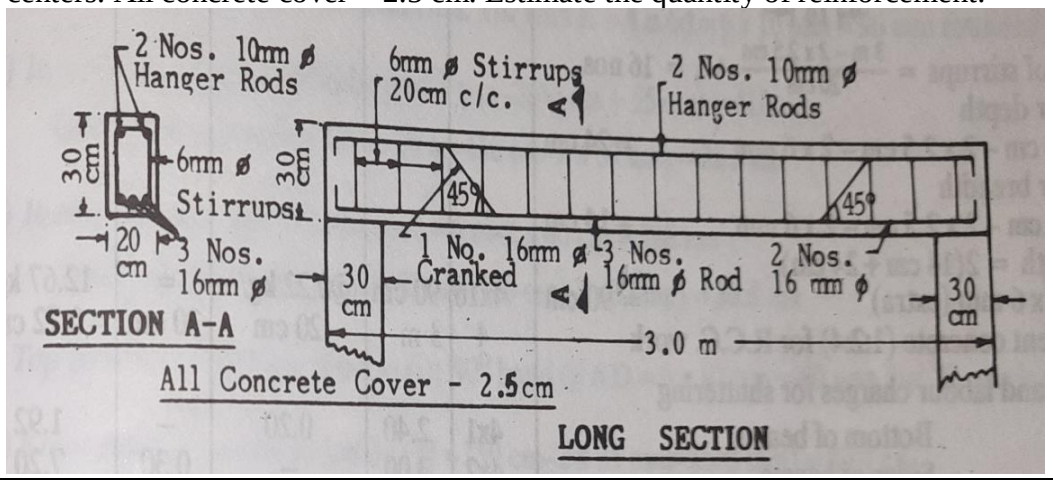
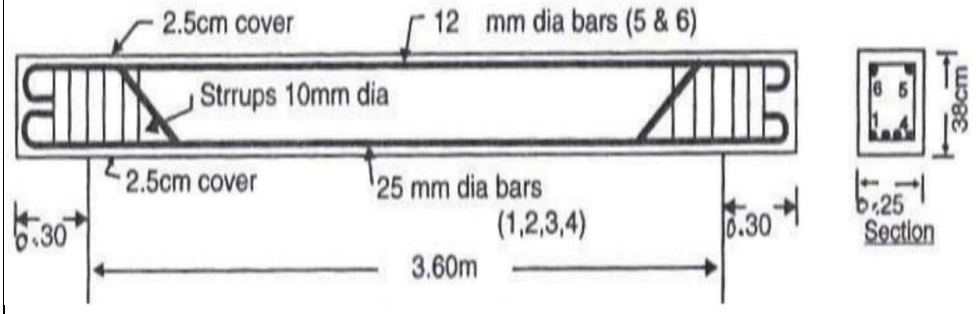
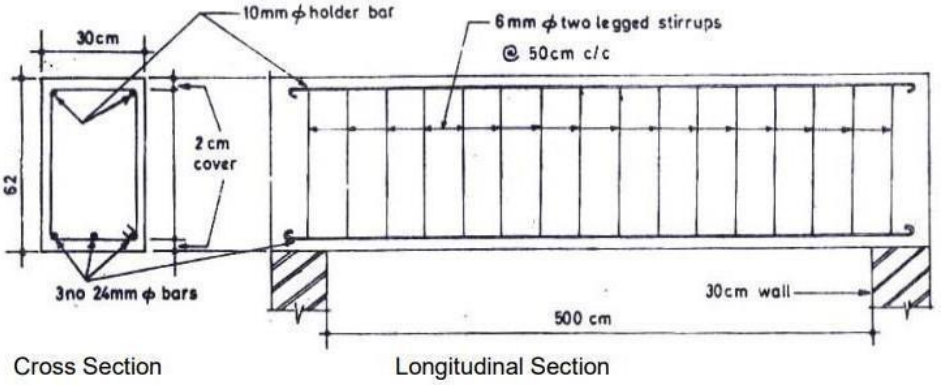
UNIT –III
R.C.C WORKS

1	**a**	What is the approximate percentage of steel reinforcement required for different components of residential building	**[L2][CO3]**	**[4M]**
	b	What is the length required for over-laps, hooks and cranks of the reinforcement and describe briefly about the bar bending schedule.	**[L1][CO3]**	**[8M]**
2		Prepare a schedule of bars for the RCC lintel shown in figure assuming bearing of the lintel be 15 cm on walls at each side. Weight of 100 mm dia bar = 0.62 kg/RM and 6 mm dia bar = 0.22 kg/RM. 	**[L3][CO3]**	**[12M]**
3		A room 600 cm long x 500 cm wide has a flat roof. There is one T-beam in the centre (cross section below the slab 30 cm x 50 cm) and the slab is 15 cm thick. Estimate the quantity of iron bars required for reinforcement (for the T-beam only) from the data given below :- Main bars – 8 nos. 25 mm dia. in 2 rows of each (all 4 in the bottom being straight an others bent) Strirrups – 10 mm dia. and 15 cm centre to centre throughout Anchor bar – 2 nos. 16 mm dia.  FIG. 6.14	**[L3][CO3]**	**[12M]**

4	Prepare a detailed estimate of a RCC roof slab of 3 metres clear span and 6 metres long from the given drawings. RCC work including centering and shuttering and steel reinforcement in detail shall be takenseparately.  	**[L3][CO3]**	**[12M]**
5	Prepare a detailed estimate of a RCC beam of 8 m clear span and 75 cm x 40 cm in section from the given drawings. Steel in detail and RCC work shall be calculated separately.  	**[L3][CO3]**	**[12M]**

6	Prepare a detailed estimate of a RCC column with foundation footing from the given drawings.  **PLAN & SECTION**	**[L3][CO3]**	**[12M]**
7	A cantilever RC beam projects beyond the fixed end by 3 m and is 30 cm x 60 cm at fixed end and reduced to 30 cm x 15 cm at the free end. At the fixed end the beam is reinforced with 4 bars 20 mm dia at the top and 2 bars are curtailed at a distance of 1.41 m from the fixed end, but the remaining 2 bars continued up to the free end. The beam is provided with 6 mm dia two legged stirrups 20 cm centre to centre for the entire length. At the bottom there are 2 bars 10 mm dia as stirrup fixture. Weight of bars are 20 mm = 2.47 kg/m, 10 mm = 0.62 kg/m, 6 mm =-.22 kg/m. assume 25 mm clear cover and the main bars are suitably anchored, but is not needed in the estimate. Estimate the quantity of reinforcement.  	**[L3][CO3]**	**[12M]**
8	A RCC rectangular beam 20 cm wide x 30 cm deep x 3.0 m overall length is reinforced with Tor steel bars 3 nos. 16 mm dia (wt.1.58 kg/m) two outer bars straight and top, two outer hanger bars are 10 mm in dia (wt.0.62 kg/m) straight andL-hooked at ends. Stirrups are 6 mm in dia MS bar (wt. 0.22 kg/m) and spaced at 20 cm	**[L3][CO3]**	**[12M]**

	centers. All concrete cover = 2.5 cm. Estimate the quantity of reinforcement.  		
9	Workout the quantity of reinforcement by preparing bar requirement schedule of a beam as per the drawing given below. Side covers 50 mm.  	**[L3][CO3]**	**[12M]**
10	The following figure shows the longitudinal section & cross section of a simple beam of clear span 5.0 m. The thickness of support wall is 300 mm. Workout the total quantity of the reinforcement in the beam. Also prepare the bar bending schedule  	**[L3][CO3]**	**[12M]**

UNIT –IV
ANALYSIS OF RATES

1	a) What is lead statement ? Illustrate the procedure to prepare the lead statement with help of table.	**[L1][CO4]**	**[6M]**
	b) What are the factors affecting the rate analysis ? Describe briefly the procedure of rate analysis.	**[L1][CO4]**	**[6M]**
2	Calculate the required materials for cement concrete and cement mortars for different proportions including bulkages and shrinkages for 100 cum.	**[L3][CO4]**	**[12M]**
3	Evaluate the rate analysis for earth work excavation for building foundations with lead of 10 m and lif of 2 m. in all types of soils and also Plain Cement Concrete (PCC) (1:5:10)	**[L3][CO4]**	**[12M]**
4	Work out the rate analysis for PCC (1:3:6) and RCC (1:1.5:3) for foundation.	**[L3][CO4]**	**[12M]**
5	a) Prepare the rate analysis for random rubble stone masonry in cement mortar (1:6) for superstructure	**[L3][CO4]**	**[6M]**
	b) Prepare rate analysis for damp proof course (DPC) in cement concrete (1:1:3) over the basement wall.	**[L3][CO4]**	**[6M]**
6	a) Evaluate the rate analysis for Brick masonry in CM (1:5) for superstructure using I class bricks	**[L3][CO4]**	**[6M]**
	b) Evaluate the rate analysis for Brick masonry in CM (1:6) for superstructure using II class bricks	**[L3][CO4]**	**[6M]**
7	a) Prepare rate analysis for coursed rubble stone masonry in cement mortar (1:4) for superstructure	**[L3][CO4]**	**[6M]**
	b) Prepare rate analysis for brick partition wall in CM (1:4) with 11.5 cm thick.	**[L3][CO4]**	**[6M]**
8	Calculate the rate analysis for Granolithic cement concrete flooring in CC (1:1:3) , with 25 mm thick and vetrified tile flooring of size 60 cm x 60 cm over cement mortar bed with 20 mm thick	**[L3][CO4]**	**[12M]**
9	Prepare the rate analysis for plastering in CM (1:3) , with 12 mm thick for ceiling and out side wall plastering in CM (1:4), with 20 mm thick.	**[L3][CO4]**	**[12M]**
10	Work out the rate analysis for white washing with two coats for out side walls and synthetic enamel paintting to wooden works with two coats over a primer coat	**[L3][CO4]**	**[12M]**

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UNIT –V
SPECIFICATIONS & VALUATION

1	What is the necessity and importance of the specification related to civil engineering constructions	**[L2][CO5]**	**[12M]**
1	a) Write the types of specification. Give their advantages and disadvantages.	**[L2][CO5]**	**[6M]**
	b) Describe the general specification for first class buildings	**[L2][CO5]**	**[6M]**
2	Write detailed specification for earthwork exaction.	**[L2][CO5]**	**[12M]**
3	Give detailed account on specifications of RCC (1:2:4).	**[L2][CO5]**	**[12M]**
4	What are different specifications for first class brick work.	**[L2][CO5]**	**[12M]**
5	Write detailed specifications for Plastering and Painting	**[L2][CO5]**	**[12M]**
6	a) Define valuation and explain briefly the purpose of valuation.	**[L2][CO6]**	**[6M]**
	b) An old building has been purchased by a person @ a cost of Rs. 6,00,000 excluding the cost of land. Calculate the amount of annual sinking fund @ 9% interest assuming the life of building as 30 years and the scrap value of the building as 10% of the purchase.	**[L3][CO6]**	**[6M]**
7	a) Explain the different methods of depreciation	**[L2][CO6]**	**[6M]**
	b) A building in an A class city is let out @ 12000/- P.M. The total out goings of the property is estimated to be 18% of the gross income, calculate the capitalized value of the property if the present rate of interest is 9% and life of the property is 50 years.	**[L3][CO6]**	**[6M]**
8	A three-storied building is standing on a plot of land measuring 800 sq.m. The plinth area of each storey is 400 sq.m. The building is of RCC framed structure and the future life may be taken as 70 years. The building fetches a gross rent of Rs.1500.00 per month. Work out the capitalized value of the property on the basis of 6% net yield.For sinking fund 3% compound interest may be assumed. Cost of land may be taken Rs.40.00 per sq m. Other data as required may be assumed suitably.	**[L3][CO6]**	**[12M]**
9	In a plot of land costing Rs.20,000.00 a building has been newly constructed at the total cost of Rs.80,000.00 including sanitary and water supply works, electrical installation, etc. The building consists of four flats for four tenants. The owner expects 8% return on the cost of construction and 5% return on the cost of land. Calculate the standard rent for each flat of the building assuming:- (i) The life of the building as 60 years and sinking fund will be created on 4% interest basis. (ii) Annual repairs cost at 1% of the cost of construction (iii) Other outgoings including taxes at 30% of the net return on the building.	**[L3][CO6]**	**[12M]**
10	Calculate the standard rent of a Government residential building newly constructed from the following data – (i) Cost of land –Rs.10,000.00 (ii) Cost of construction of the building –Rs.40,000.00 (iii) Cost of roads within the compound, and fencing –Rs.20,00.00 (iv) Cost of sanitary and water supply works – 8% of the cost of building (v) Cost of electric installation including fans – 10% of the cost of building (vi) Municipal House tax – Rs.400.00 per annum (vii) Water tax – Rs.250.00 per annum (viii) Property tax – Rs.140.00 per annum	**[L3][CO6]**	**[12M]**

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