



**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)**

Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (DESCRIPTIVE)

Subject with Code: Estimation, Costing and Valuation(19CE0115)

Course & Branch: B.Tech - CE

Regulation: R19

Year & Sem: III-B.Tech&I-Sem

**UNIT –I
ESTIMATING AND ESTIMATE OF BUILDINGS**

1	a	Define estimate. What is the purpose of estimate?	[L1][CO1]	[4M]
	b	What are differences between revised and supplementary estimate?	[L2][CO1]	[4M]
	C	Define Contingencies and Workcharged establishment.	[L1][CO1]	[4M]
2		List and explain different types of estimates in detail.	[L1][CO1]	[12M]
3		Write brief note on following main items of work (a) Earthwork (b) Concrete in foundation (c) Damp proof course (d) Masonry (e) Plastering	[L2][CO1]	[12M]
4.		Explain longwall and shortwall method and centreline method in detail	[L1][CO1]	[12M]
5.		Mention units of dimensions for various materials and works in construction.	[L2][CO1]	[12M]
6		Calculate the quantities of the following items for the building shown in fig using Longwall and short wall method. (a) Earth work in excavation (b) Brick work in foundation and plinth (c) PCC (1: 5: 10) below the foundation (d) Damp Proof Course (e) Brick masonry in CM (1:6) for super structure.	[L3][CO1]	[12M]

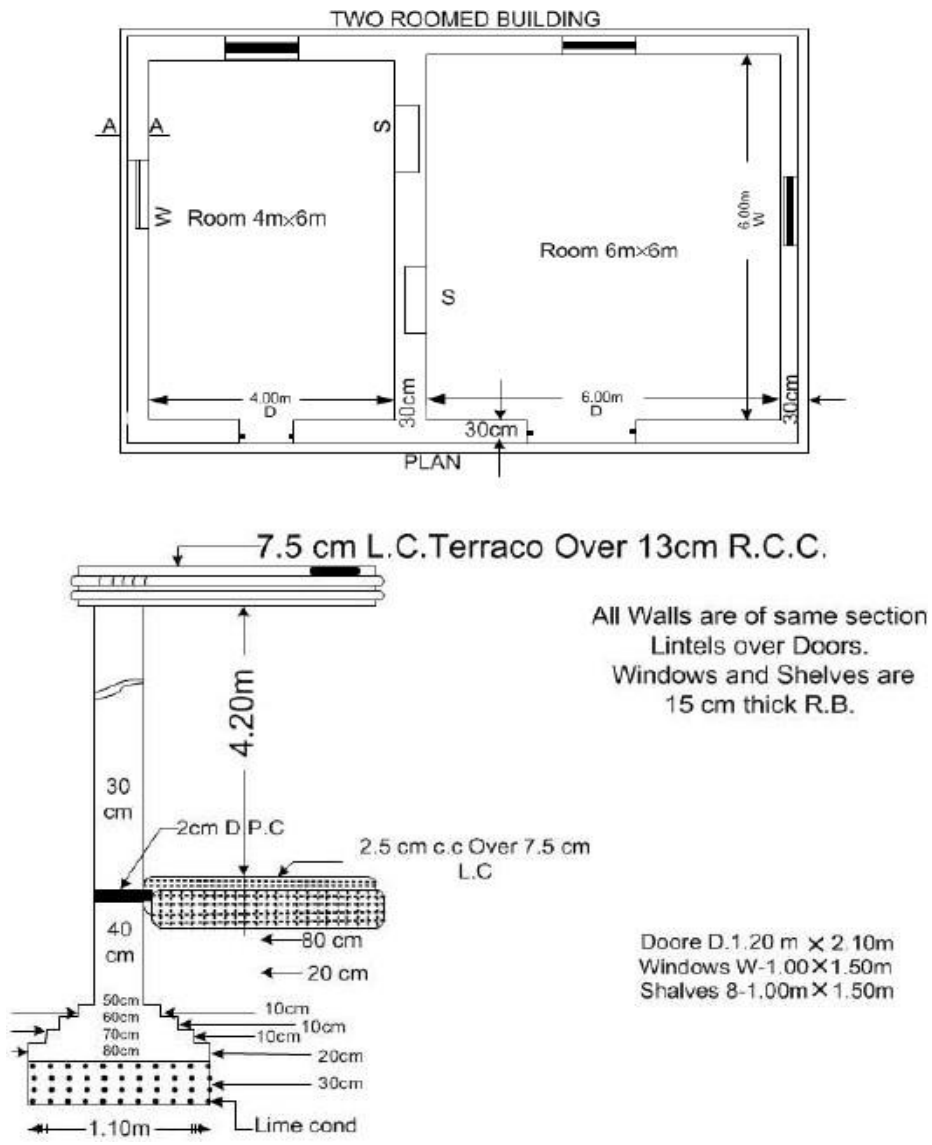


Fig.1

8 Estimate the quantities of the following items of a two roomed building from the given plan and sections as shown in Fig.2. [L3][CO1] [12M]

(1) Earthwork in exaction in foundation (2) Lime concrete in foundation
 (3) 1st class brick in 1:6 cement mortar in foundation and plinth
 (4) 2.5 cm thick damp proof course and
 (5) 1st class brickwork in 1:6 cement mortar in superstructure.

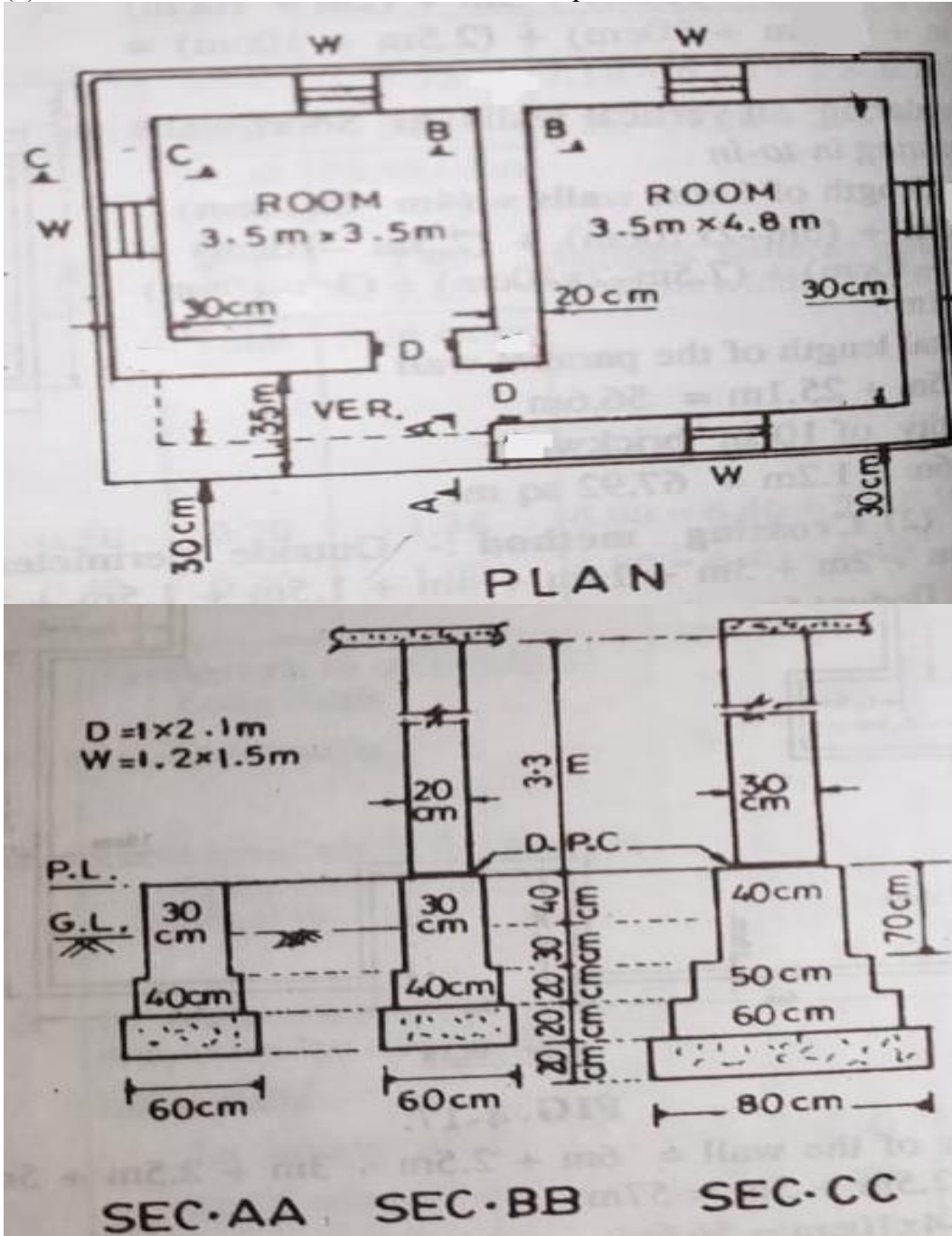


Fig.2

- 9 For the residential building shown in Fig.3 estimate the following:
- Earthwork in excavation
 - C.R. masonry in C.M (1:6) in the basement
 - Laterite stone masonry in C.M. (1:5) in the superstructure
 - R.C.C (1:2:4) in chajja, lintel and roof slab
 - Plastering wall surface in C.M (1:3) 12 mm thick

[L3][CO1] [10M]

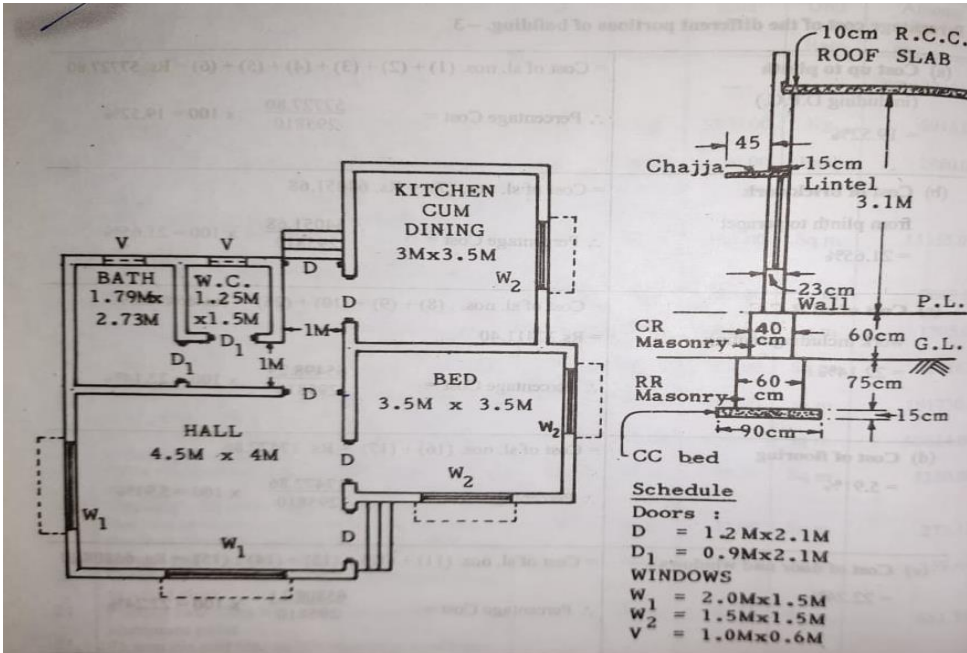
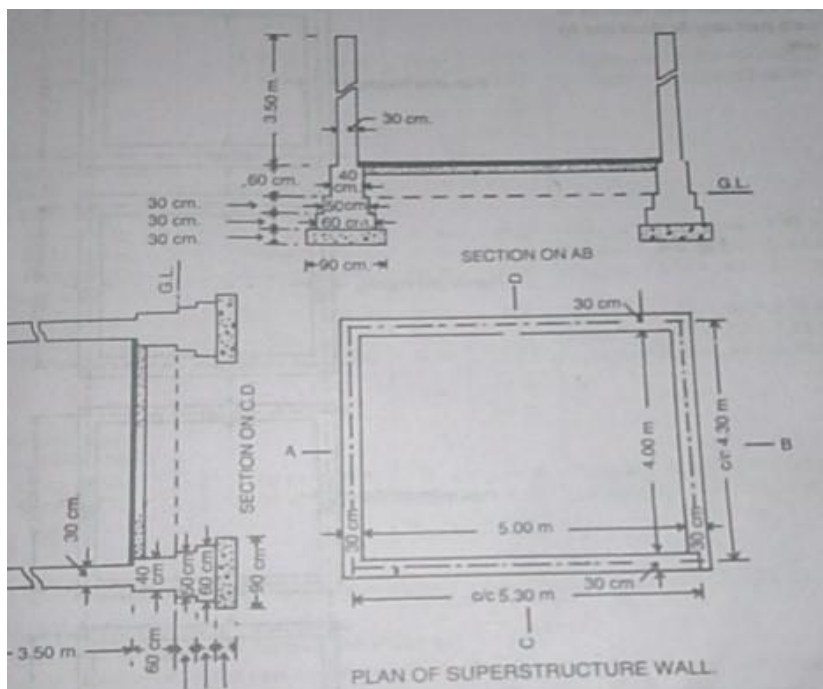


Fig.3

- 10 The following figure represents the plan of superstructure wall of a single room building of 5m x 4m and sections represent the crosssections of walls with foundation. Estimate the quantities of
- Earthwork in excavation in foundation
 - concrete in foundation
 - Brickwork in foundation and plinth
 - Brickwork in super structure and also draw the plans at different levels.
- Adopt longwall and shortwall method.

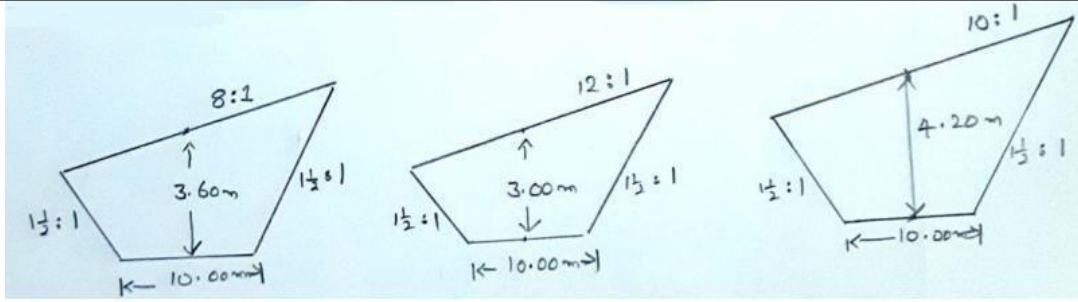
[L3] [CO1] [12M]



UNIT –II
ROAD ESTIMATING AND EARTH WORK FOR CANALS

1	a	Define <i>Lead</i> and <i>Lift</i> .	[L1][CO2]	[4M]																								
	b	Define turfing. Give the equation for calculating turfing area for a road in banking having formation width 'B', formation depth 'd', side slopes S:1 (H:1) and length 'L'.	[L2][CO2]	[4M]																								
	c	Write Prismoidal formula for calculating quantity of earth, for two sections A ₁ and A ₂ which are separated by a distance or length L.	[L2][CO2]	[4M]																								
2	Write a detailed note on different methods of estimating earthwork in construction.		[L1][CO2]	[12M]																								
3	A road portion of 200 m length is having heights 1.00 m and 1.60 m in banking at the two ends. The road portion in an uniform ground with a formation width 10 m and side slopes being 2:1 (horizontal: vertical). Assume that there is no transverse slope. (i) Calculate the quantity of earthwork using <i>Mid Sectional Area Method</i> , <i>Mean Sectional Area Method</i> and <i>Prismoidal Formula Method</i> . (ii) Compare the two methods with <i>Prismoidal Formula Method</i> and report the difference of quantities in percentage. (iii) If the side slopes are to be provided with a stone pitching of 15 cm thick, calculate the cost of pitching at the rate of Rs.220/- per cu.m		[L3][CO2]	[12M]																								
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 10 th 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]																								
		<table border="1"> <thead> <tr> <th>Chainage</th> <th>RL of ground (m)</th> </tr> </thead> <tbody> <tr><td>10</td><td>105.00</td></tr> <tr><td>11</td><td>105.60</td></tr> <tr><td>12</td><td>105.44</td></tr> <tr><td>13</td><td>105.90</td></tr> <tr><td>14</td><td>105.42</td></tr> <tr><td>15</td><td>104.30</td></tr> <tr><td>16</td><td>105.00</td></tr> <tr><td>17</td><td>104.10</td></tr> <tr><td>18</td><td>104.62</td></tr> <tr><td>19</td><td>104.00</td></tr> <tr><td>20</td><td>103.30</td></tr> </tbody> </table>	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		
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5	<p>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.60% sq.m.</p> <table border="1" data-bbox="603 405 1038 880"> <thead> <tr> <th>Chainage</th> <th>RL of ground (m)</th> </tr> </thead> <tbody> <tr><td>10</td><td>105.00</td></tr> <tr><td>11</td><td>105.60</td></tr> <tr><td>12</td><td>105.44</td></tr> <tr><td>13</td><td>105.90</td></tr> <tr><td>14</td><td>105.42</td></tr> <tr><td>15</td><td>104.30</td></tr> <tr><td>16</td><td>105.00</td></tr> <tr><td>17</td><td>104.10</td></tr> <tr><td>18</td><td>104.62</td></tr> <tr><td>19</td><td>104.00</td></tr> <tr><td>20</td><td>103.30</td></tr> </tbody> </table>	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	[L3][CO2]	[12M]														
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6	<p>Estimate the cost of earthwork for a portion of road for 400 m length from the following data:- Formation width of the road is 10 m. Side slopes are 2:1 in banking 1.5 in cutting.</p> <table border="1" data-bbox="256 1059 1192 1520"> <thead> <tr> <th>Station</th> <th>Distance in m</th> <th>RL of ground in m</th> <th>RL of formation</th> </tr> </thead> <tbody> <tr><td>25</td><td>1000</td><td>51.00</td><td rowspan="12">RL of formation is 52.00. Downward gradient of 1 in 200</td></tr> <tr><td>26</td><td>1040</td><td>50.90</td></tr> <tr><td>27</td><td>1080</td><td>50.50</td></tr> <tr><td>28</td><td>1120</td><td>50.80</td></tr> <tr><td>29</td><td>1160</td><td>50.60</td></tr> <tr><td>30</td><td>1200</td><td>50.70</td></tr> <tr><td>31</td><td>1240</td><td>51.20</td></tr> <tr><td>32</td><td>1280</td><td>51.40</td></tr> <tr><td>33</td><td>1320</td><td>51.30</td></tr> <tr><td>34</td><td>1360</td><td>51.00</td></tr> <tr><td>35</td><td>1400</td><td>50.60</td></tr> </tbody> </table>	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 1 in 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	[L3][CO2]	[12M]
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7	<p>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 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 <i>Mid-Sectional Area</i>, <i>Mean Sectional Area</i> and <i>Prismoidal Method</i> if the rate of earthwork in exaction is Rs.275%cu.m.</p>	[L3][CO2]		[12M]																																					



Section at 10th Chainage

Section at 11th Chainage

Section at 12th Chainage

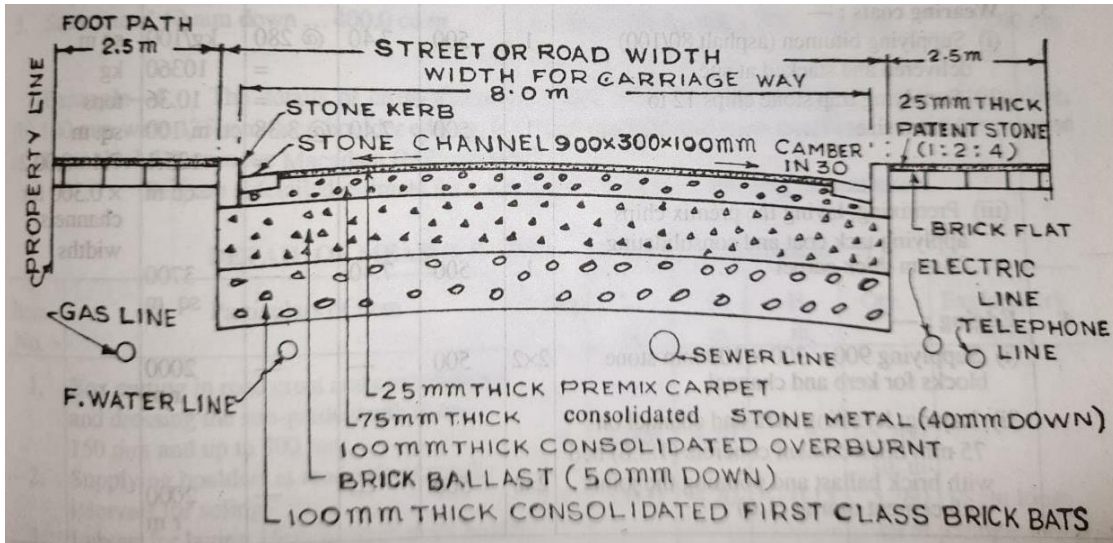
8 Calculate the quantity of earthwork of a hill road in side-long ground, for a length of 200 m from 5 to 10 chainage, tangent of the angle of transverse slope of ground ($\tan\theta$) is equal to 0.2 although as measured by Ghat Tracer. The length of chain is 20 m. The formation width of the road is 7 m and slope bank is 2:1. R.L. of ground and formation level at the centre of the road are as follows:-

[L3][CO2] [12M]

Chainage	Distance (m)	RL of ground at centre (m)	RL of formation at centre (m)
5	100	200.00	201.20
6	120	199.75	201.80
7	140	200.50	202.40
8	160	201.70	203.00
9	180	202.40	203.60
10	200	201.50	204.20

9 Detailed dimensioned sketch cross-section of a city street having metalled portion of 8 m for the carriageway is shown in figure. Prepare an estimate for constructing 500 m length of this street. Indicate also quantities of materials.

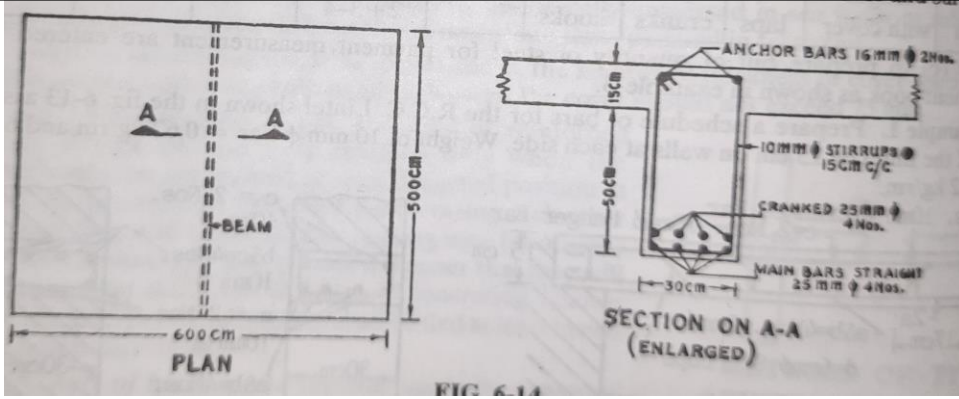
[L3][CO2] [12M]



10	Calculate the quantity of earthwork of a portion of a channel with the following data:- Bed width = 3 m; Free board = 44 cm; Slope of digging is 1:1; Side slope of banking 1.5:1; Full supply depth = 1m; Top width of both the bank = 1.5 m.	[L3][CO2]	[12M]																		
				<table border="1"> <thead> <tr> <th>Rd.(m)</th> <th>Groundlevel(m)</th> <th>Proposed bed level (m)</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>225.24</td> <td>224.00</td> </tr> <tr> <td>30</td> <td>224.80</td> <td>223.94</td> </tr> <tr> <td>60</td> <td>224.43</td> <td>223.88</td> </tr> <tr> <td>90</td> <td>224.12</td> <td>223.82</td> </tr> <tr> <td>120</td> <td>224.50</td> <td>223.76</td> </tr> <tr> <td>150</td> <td>224.98</td> <td>223.70</td> </tr> </tbody> </table>	Rd.(m)	Groundlevel(m)	Proposed bed level (m)	0	225.24	224.00	30	224.80	223.94	60	224.43	223.88	90	224.12	223.82	120	224.50
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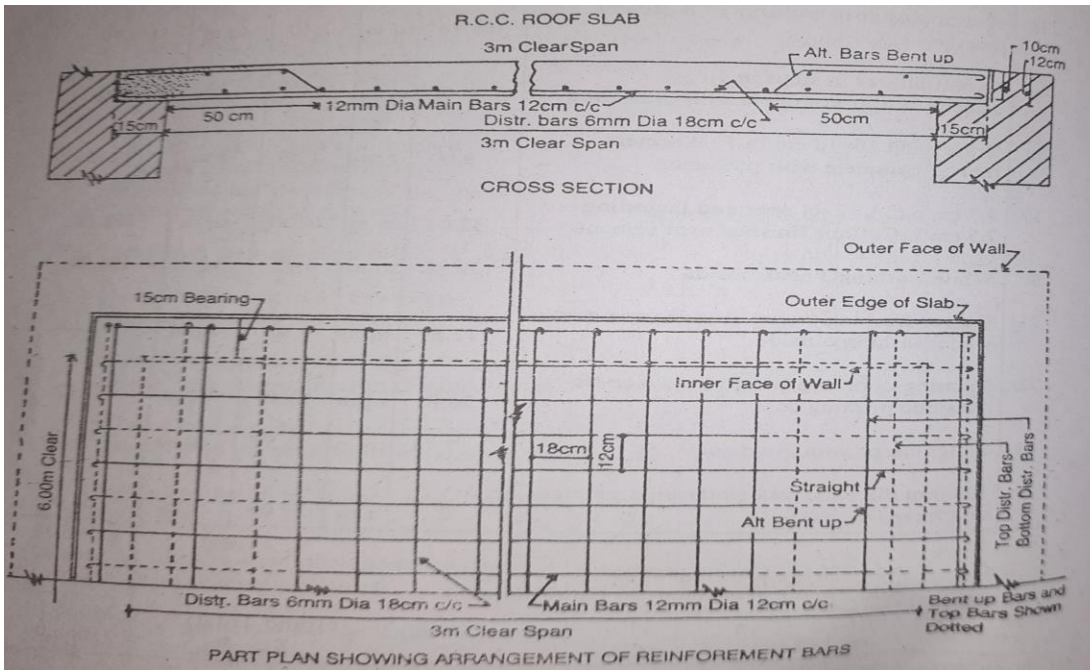
**UNIT –III
R.C.C WORKS**

a	What are different types of reinforcement bars used in RCC members?	[L2][CO3]	[4M]
	What is schedule of bars?	[L1][CO3]	[4M]
	What are different items of work estimated in reinforced cement concrete work?	[L1][CO3]	[4M]
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]
<p>The diagram illustrates the reinforcement details for an RCC lintel. It includes a longitudinal section and two cross sections (at mid-span and at support). The longitudinal section shows a 1m long lintel with a height of 15 cm. It features 2 cranked bars (b), 2 hanger bars (c), 4 bars (a&b), and 6mm stirrups (d). The cross sections show the reinforcement at mid-span and at support, with dimensions of 30 cm for the width and 15 cm for the height.</p>			
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 and others bent) Stirrups – 10 mm dia. and 15 cm centre to centre throughout Anchor bar – 2 nos. 16 mm dia	[L3][CO3]	[12M]



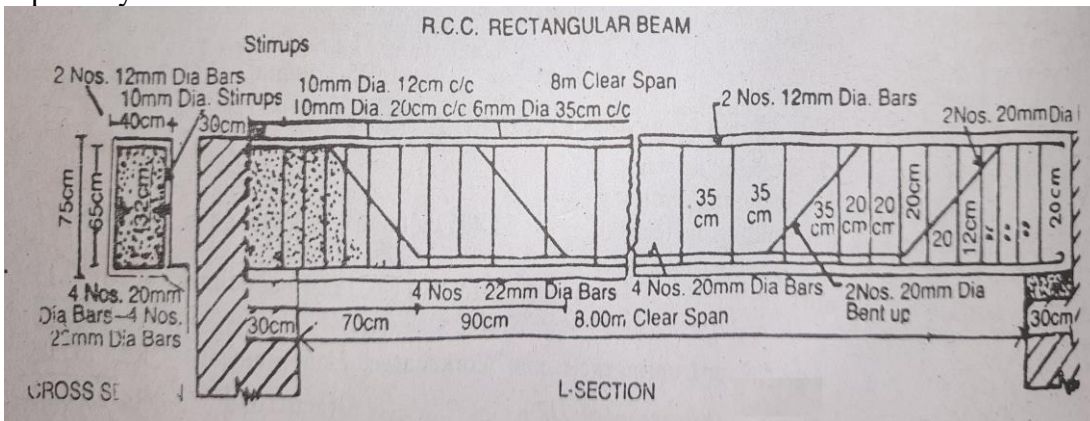
4 Prepare a detailed estimate of a RCC roof slab of 3 metres clear span and 6 metres long from the given drawings. RCC work including centering and shuttering and steel reinforcement in detail shall be taken separately.

[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.

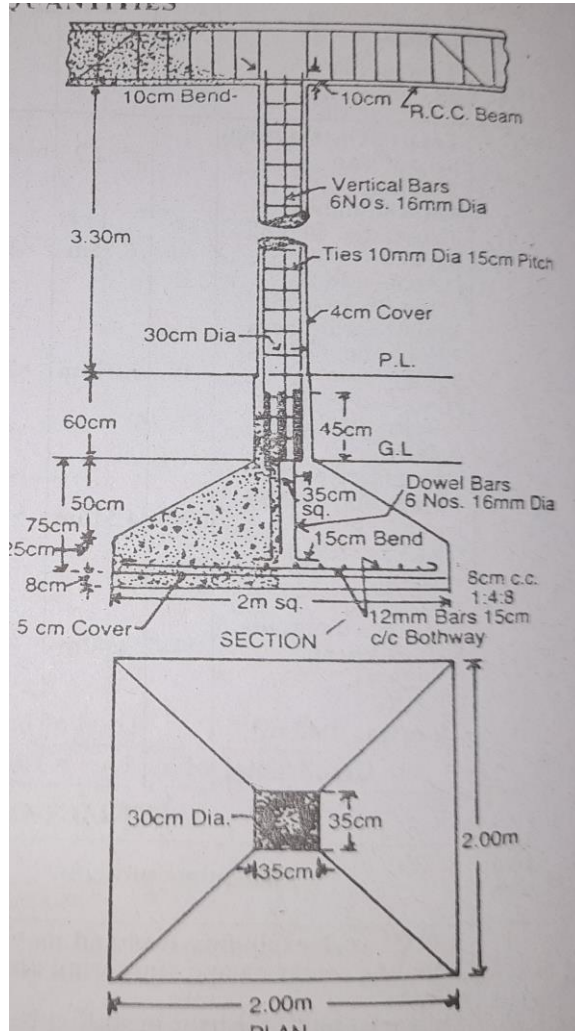
[L3][CO3] [12M]



6 Prepare a detailed estimate of a RCC column with foundation footing from the given drawings.

[L3][CO3]

[12M]

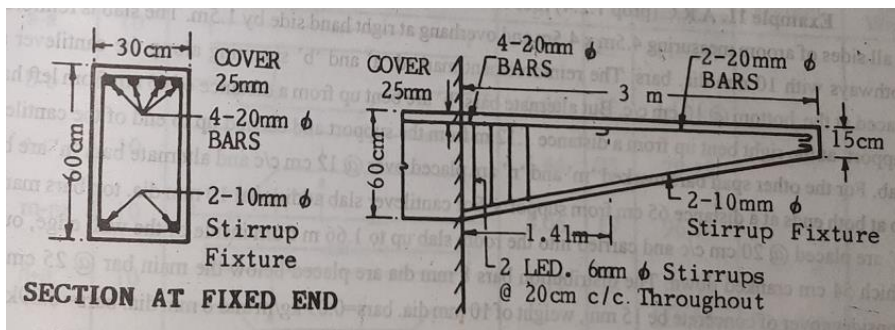


PLAN & SECTION

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 = 0.22 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]

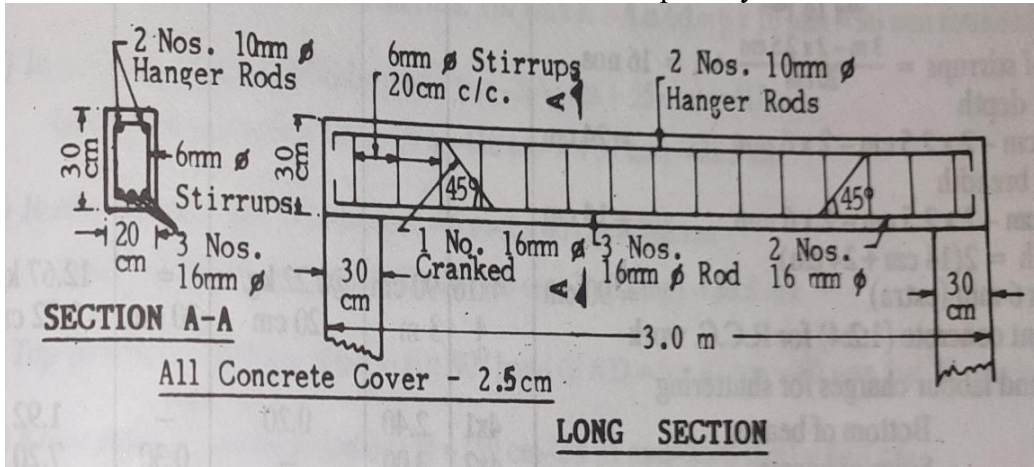


8 A RCC rectangular beam 20 cm wide x 30 cm deep x 3.0 m overall length is reinforced with Tor steel bars 3 nos. 16 mm dia (wt.1.58 kg/m) two outer bars straight and top, two outer hanger bars are 10 mm in dia (wt.0.62 kg/m) straight and L-hooked at ends. Stirrups are 6 mm in dia MS bar (wt. 0.22 kg/m) and spaced at 20 cm

[L3][CO3]

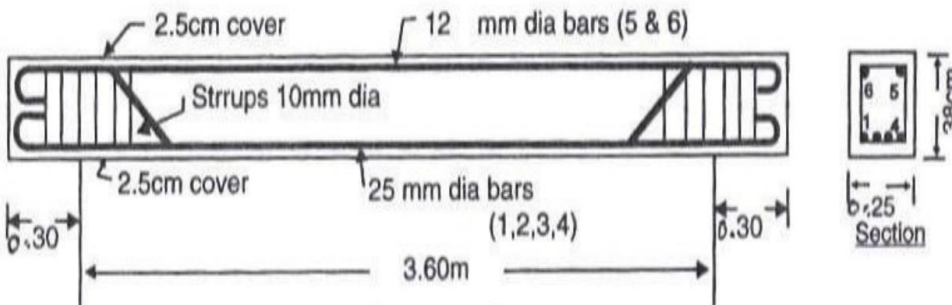
[12M]

centers. All concrete cover = 2.5 cm. Estimate the quantity of reinforcement.



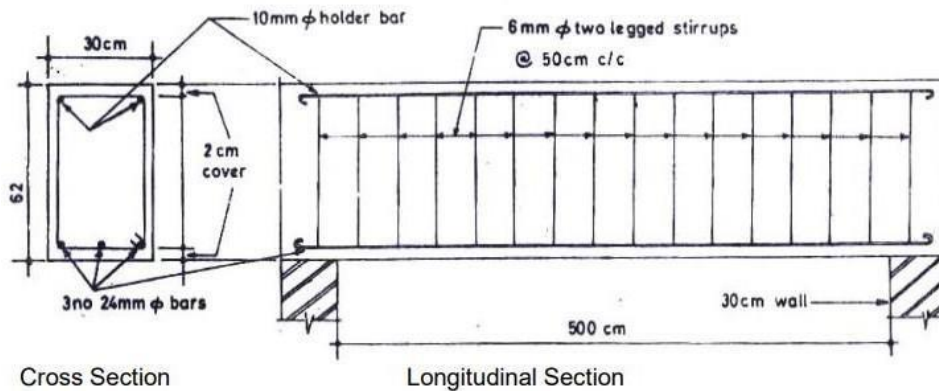
9 Work out the quantity of reinforcement by preparing bar requirement schedule of a beam as per the drawing given below. Side covers 50 mm.

[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. Work out 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	Define rate analysis. What is the purpose of rate analysis?	[L1][CO4]	[4M]
	b	List various expenses that comes under overhead costs.	[L1][CO4]	[4M]
	c	What are different quantities required for brickwork in 1:6 cement sand mortar for 10 cu.m?	[L3][CO4]	[4M]
2	(a)	Prepare the rate per cu.m for 1:2:4 cementconcrete.	[L3][CO4]	[6M]
	(b)	Arrive the rate for I-class brickwork in superstructure with 20 x 10 x 10 cm brick with 1:6 cement sandmortar.	[L3][CO4]	[6M]
3		Work out rate per cu.m for RCC work in beams and slabs with 1:1½:3 cement concrete.	[L3][CO4]	[12M]
4	(a)	Prepare the reate per cu.m for random rubble stone masonry in superstructure in 1:6 cement sandmortar.	[L3][CO4]	[6M]
	(b)	What is the rate per sq.m for constructing 12 mm thick cement plastering in ceiling with 1:3 cement sandmortar?	[L3][CO4]	[6M]
5		Calculate the rate per cu.m for providing and laying plain cement concrete (M10) nominal mix in foundation trenches including compacting and curing.	[L3][CO4]	[12M]
6	(a)	Prepare rate per cu.m for exaction over are for a basement in hard soil, depth 1.5 m and removing the material through a distance of 50m.	[L3][CO4]	[6M]
	(b)	prepare rate per sq.m for laying Mosaic or Terrazo titlefloor.	[L3][C04]	[6M]
7	(a)	Perform rate analysis for arrive rate per sq.m for 1:2 cement mortar inpointing.	[L3][CO4]	[6M]
	(b)	What is the rate per sq.m for providing white washing onecoat?	[L3][CO4]	[6M]
8	(a)	Prepare rate per cu.m for constructing rubble stone masonry in superstructure 1:6 cement sandmortar.	[L3][CO4]	[6M]
	(b)	Prepare rate per sq.m for painting one coat over a coat ofpriming.	[L3][C04]	[6M]
9	(a)	Prepare rate for ashlar masonry in superstructure in 1:6 cement sandmortar.	[L3][CO4]	[6M]
	(b)	Calculate rate per sq.m for laying 2 cm thick damp proof course with 1:2 cement mortar.	[L3][C04]	[6M]
10	(a)	Prepare earthwork in banking or in exaction in road or canal work in layer of 20 cm including ramming, dressing etc., up to 30 m load and 1.5 mlift.	[L3][CO4]	[6M]
	(b)	arrive rate per sq.m for laying 2.5 cm thick 1:1.5:3 cement concrete as damp proof course.	[L3][CO4]	[6M]

UNIT –V
SPECIFICATIONS & VALUATION

1	a	Write brief note on types of specifications.	[L1][CO5]	[4M]
	b	What is the purpose of valuation?	[L1][CO6]	[4M]
	c	What is the difference between obsolescence and depreciation?	[L2][CO6]	[4M]
2		List and explain general specifications of a first class building.	[L2][CO5]	[12M]
3		Write detailed specification for earthwork excavation.	[L2][CO5]	[12M]
4		Give detailed account on specifications of 1:2:4 cement concrete.	[L2][CO5]	[12M]
5		What are different specifications for first class brick work.	[L2][CO5]	[12M]
6		List and explain various methods of calculating depreciation.	[L2][CO6]	[12M]
7		Give detailed account on different methods of valuation.	[L2][CO6]	[12M]
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]

Prepared by:

G.YAMINI

Asst. Professor/CE