INSTITUTEOFAERONAUTICALENGINEERING

(Autonomous)
Dundigal, Hyderabad-500043

CIVIL ENGINEERING

TUTORIAL QUESTION BANK

Course Title	**ESTIMATING AND COSTING**				
Course Code	ACE017				
Programme	B.Tech				
Semester	VII	CE			
Course Type	Core				
Regulation	**IARE - R16**				
Course Structure	**Theory**			**Practical**	
	Lectures	**Tutorials**	**Credits**	**Laboratory**	**Credits**
	3	1	4	-	-
Chief Coordinator	Mr. CH.Venugopal Reddy, Asst. Professor				
Course Faculty	Mr. CH.Venugopal Reddy, Asst. Professor Mr. .K. Tarun Kumar, Assistant Professor				

COURSE OBJECTIVES:

The course should enable the students to:	
I	Summarize the basic principal and standard methods for working out quantities in estimating.
II	Demonstrate the detailed estimate of buildings and workout rate analysis of the various items of work
III	Understand the material requirements as per specified norms and standards.
IV	Assess the valuation of buildings and provide practical knowledge of standard specifications of items of building construction.

COURSE OUTCOMES (COs):

CO 1	Understand the preparation of an Abstract Estimate and detailed estimate of building.
CO 2	Determine earth work quantity for roads and canals, design bar bending schedule for reinforcement works.
CO 3	Understand preparation of Notice inviting tender document for bidding, tendering process and examining rates of civil works.
CO 4	Identify specifications and tendering process for contracts and create various tender documents for bidding purpose.
CO 5	Evaluate the valuation of building for different specifications and create new technologies to develop concrete estimating methods.

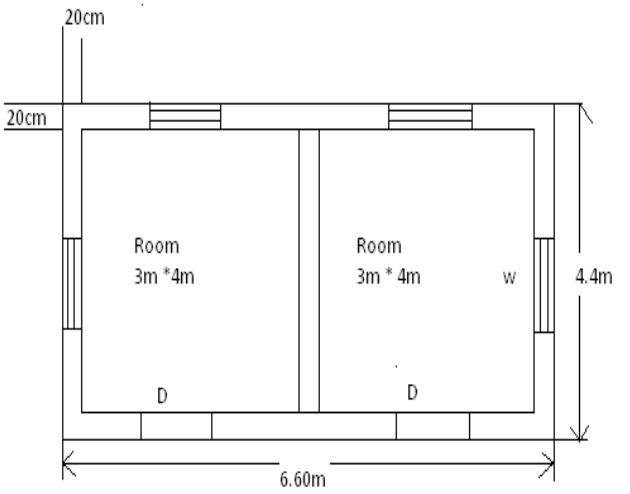
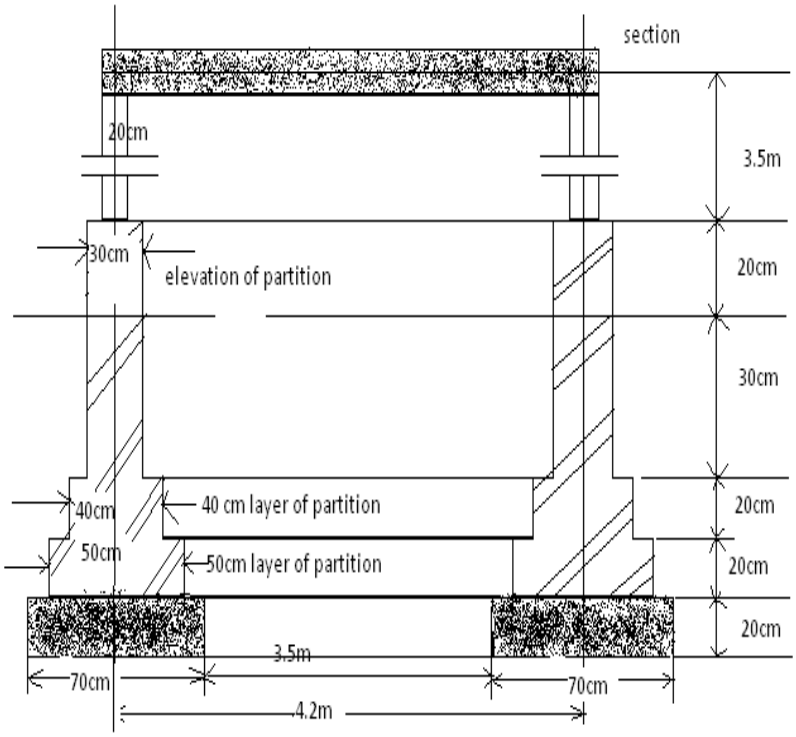
COURSE LEARNING OUTCOMES (CLOs):

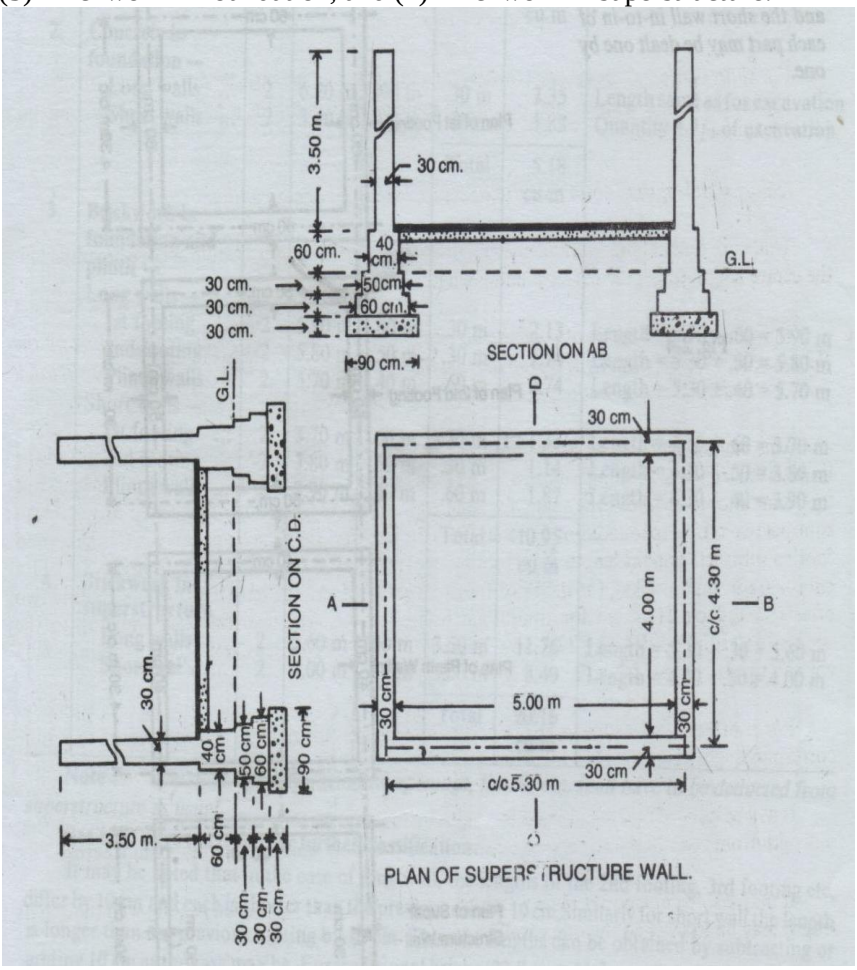
ACE017.01	Interpreting the preparation of an Abstract Estimate for a Residential Building.
ACE017.02	Organizing the units for various quantities of items of work.
ACE017.03	Associating the preparation of detailed estimation of building.
ACE017.04	Demonstrate the calculation of earth work quantity for roads and canals
ACE017.05	Evaluate the rates for various items of work.
ACE017.06	Understand how to prepare a Notice inviting tender document for bidding.
ACE017.07	Analyze the building as per new estimated cost.
ACE017.08	Have knowledge on specifications and tendering process for contracts.
ACE017.09	Examining the rate analysis of various items of civil works
ACE017.10	Design and Prepare Bar bending schedule for reinforcement works..
ACE017.11	Calculate the quantities of steel for different items of work.
ACE017.12	Identify specifications and tendering process for contracts.
ACE017.13	Classify the types, formation, terms and conditions in contracts and arbitration.
ACE017.14	Prepare a bid analysis for a given sub trade.
ACE017.15	Create various Tender documents for bidding purpose.
ACE017.16	Evaluate the valuation of building for different specifications.
ACE017.17	Create new technologies to develop concrete estimating methods for more ethical and enhanced usage.
ACE017.18	Possess the knowledge and skills for employability.
ACE017.19	Will able to value a property, price escalation recommendations and auditing.
ACE017.20	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

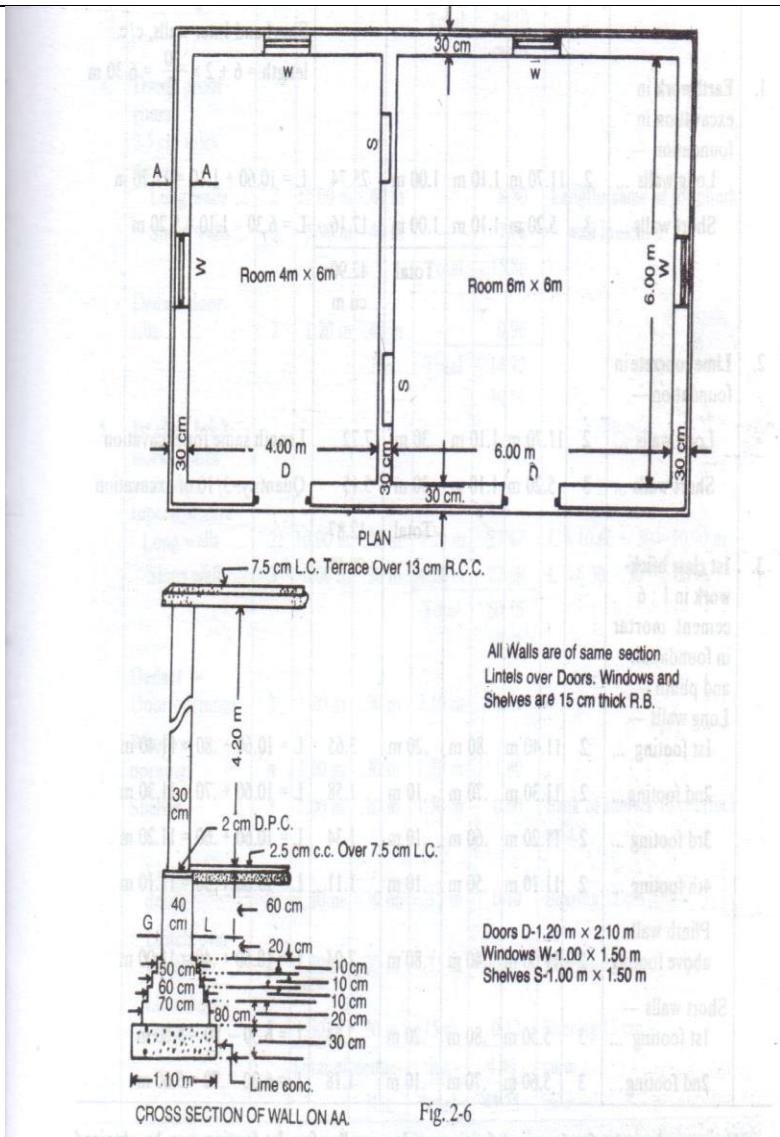
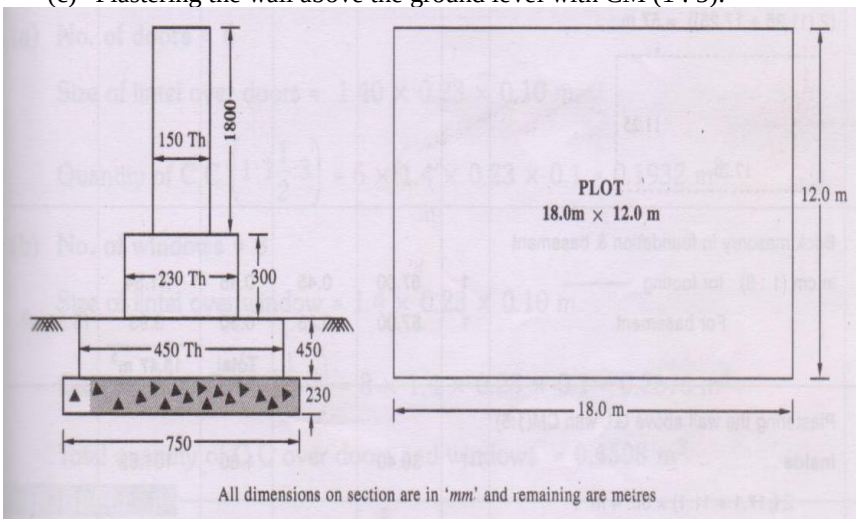
TUTORIAL QUESTION BANK

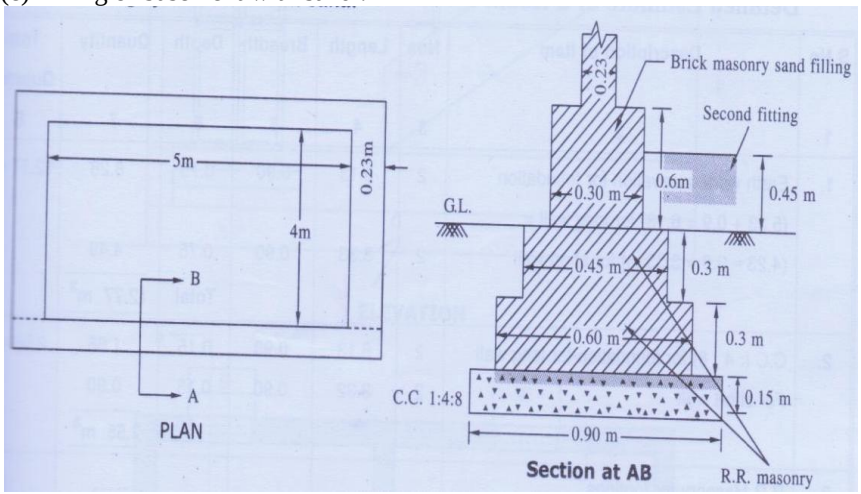
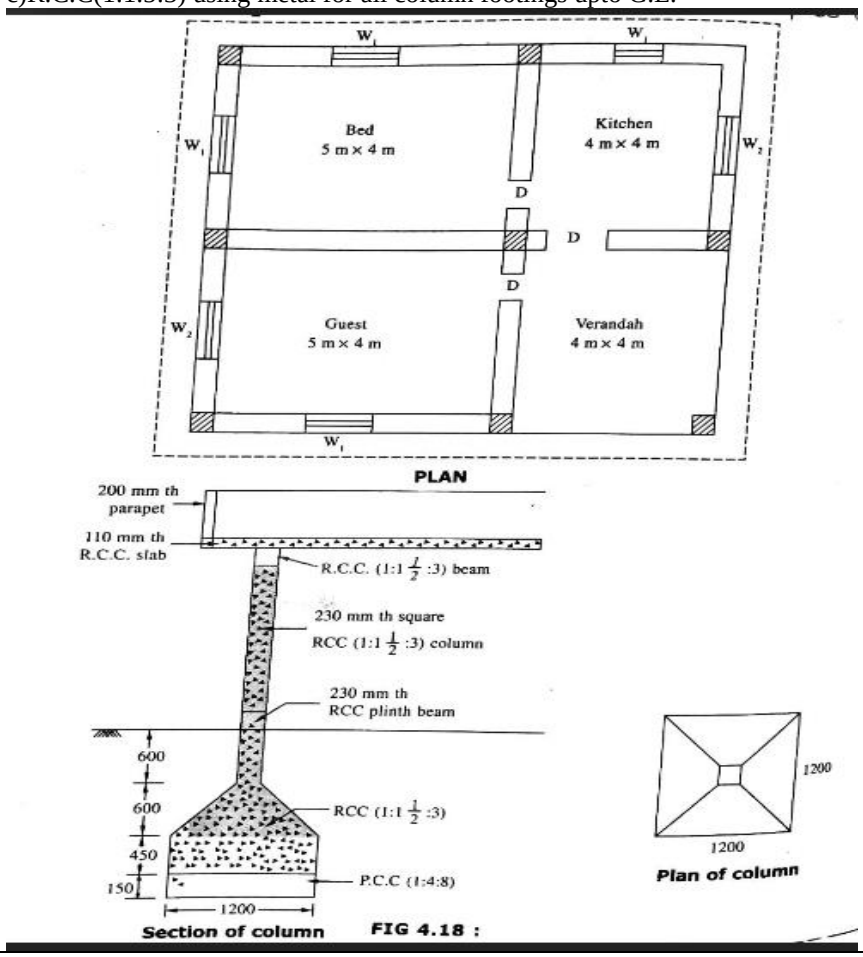
UNIT- I				
GENERAL ITEMS OF WORK IN BUILDING				
Part - A (Short Answer Questions)				
S No	**QUESTIONS**	**Blooms Taxonomy Level**	**Course Outcomes**	**Course Learning Outcomes (CLOs)**
1	Define Estimation?	Remember	CO 1	ACE017.01
2	Define Specifications?	Understand	CO 1	ACE017.01
3	Explain Detailed estimate ?	Remember	CO 1	ACE017.01
4	Explain Abstract estimate ?	Remember	CO 1	ACE017.02
5	State the units of plastering.	Remember	CO 1	ACE017.02
6	State the units of Damp proof course.	Remember	CO 1	ACE017.02
7	Explain Long wall-Short wall method.	Understand	CO 1	ACE017.03
8	Explain Centre line method.	Understand	CO 1	ACE017.03
9	List out main items of work of a bulding with unit measurement.	Remember	CO 1	ACE017.02
10	" An estimate is never the actual cost of work" Justify your answer with a suitable example.	Understand	CO 1	ACE017.04
11	State the units of pointing.	Remember	CO 1	ACE017.02
12	Write the units of measurement for Doors And Windows.	Remember	CO 1	ACE017.02
13	Write the units of measurement for Sand Filling In Basement.	Remember	CO 1	ACE017.02
14	Write the units of measurement for Steel Work.	Remember	CO 1	ACE017.04
15	Write the units of measurement for Plastering.	Remember	CO 1	ACE017.02
16	Write the units of measurement for Plain Cement Concrete For Foundations.	Remember	CO 1	ACE017.04
17	Write the units of measurement for Damp Proofing Course With Specified Thickness.	Remember	CO 1	ACE017.02
18	Write the units of measurement for R.C.C Pipes.	Remember	CO 1	ACE017.02
19	Write the units of measurement for Flooring.	Remember	CO 1	ACE017.02
20	What is approximate estimate?	Understand	CO 1	ACE017.03
Part - B (Long Answer Questions)				
1	List out the difference between centre line method & long wall-short wall method.	Understand	CO 1	ACE017.03
2	List and explain any three approximate methods of estimating for building.	Understand	CO 1	ACE017.03
3	State the difference between detailed estimate and abstract estimate.	Understand	CO 1	ACE017.04
4	Tabulate formats neatly of detailed estimate and abstract estimate separately.	Understand	CO 1	ACE017.03
5	What is an approximate estimate ? How it is prepared.	Understand	CO 1	ACE017.03
6	State the purpose of approximate estimate and give the different methods adopted.	Understand	CO 1	ACE017.04
7	State the different approximate methods of estimating civil engg structures. Indicating the methods of estimating the hospital and college.	Understand	CO 1	ACE017.03
8	Prepare a plinth area estimate of a building with a total plinth area of 240m^2.Given that 1)Plinth area rate Rs 9000/- per m^2. 2)Extra for architectural appearance = 1.5% of the building cost. 3)Extra for Electrical installations = 14% of building cost. 4)Extra for water supply & sanitary installation = 5% of building cost. 5)Contingencies -3% 6)Supervision charges – 8%	Understand	CO 1	ACE017.03
9	Prepare the approximate estimate of a proposed construction of a building with the following. a)Plinth area = 116m^2 b)Cost per unit area = Rs 1800/- per m^2. c)Electrification @ = 7% of building cost. d)Formation of roads and lawns at 5% building cost. e)P.S charges at 3% building cost.	Understand	CO 1	ACE017.03

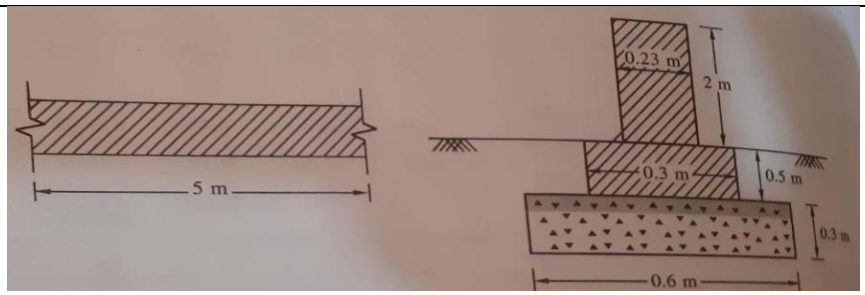
10	Prepare a preliminary estimate of cinema theatre whose cubic contents are10,000m^3.Cost of theatre building is Rs 500 per m^3.Assume suitable provisions. 1)Water supply & sanitary charges at 12.5% of building cost. 2)Electical installations charges at 12.5% of building cost. 3) Add 3% for petty supervising & contingencies on over all cost.	Understand	CO 1	ACE017.04
11	Prepare a rough estimate for a proposed commerical complex for a municipal corporation for the following data. Plinth area =Rs 500/per m^2/floor. Height of each floor = 3m No of stories = Ground+2. Cubical content rate = Rs 1000/- per m^3 Provisions are given below. a)Water supply & sanitation = 8% of building cost . b)Electrification = 6% of building cost. c)Fluctuation of rates = 5% of building cost. d)Contractor's margin = 10% of total cost. e)Petty supervision and contingencies = 3% of total cost.	Understand	CO 1	ACE017.03
12	Prepare a rough estimate of a proposed commerical complex in the corporation limits for the following. Plinth area= Rs 400m^2 /floor Height of each storey = 3m. No of stories = G+2 =3 Floors Cubic content rate = Rs 3000/- per m^3. Provide the following provisions as percentage of building cost. 1.W.S and sanitary arrangements -8%. 2.Electricfication – 6%. 3.Fluctuation of rates- 5% Provide the following provisions as percentage of building cost. 4. Contractors profit-10%. 5.P.S. and contingencies- 3%.	Understand	CO 1	ACE017.04
13	Prepare an approximate estimate of a polytechnic hostel for 180 students capacity. The cost of construction of a hostel in adjacent campus recently including all provisions arrived at 50000/- per student. Deterrmine the total cost of hostel building.	Understand	CO 1	ACE017.02
14	Prepare an approximate estimate of a hospital building for 20 beds. The cost of construction all together for each bed is Rs 80,000/-.Determine the total cost of hospital building.	Understand	CO 1	ACE017.03
15	To prepare the rough estimate of a sostel building which accommodates 90 students. The cost of construction including all provisions is Rs 50000/- per student. Determine the total cost of hostel building?	Understand	CO 1	ACE017.04
16	Calculate the quantity of cement concrete (1:1.5:3) required for R.C.C lintels over doors and windows of a residental building. There are 6 doors of size 1.2x2.10 and 8 windows of size 1.10x1.80m. Thickness of wall is 230mm and thickness of lintel is 100mm and a bearing on either side of doors and windows is 150mm.	Understand	CO 1	ACE017.03
17	Estimate the quantities for the following items for the figure given below using long and short wall method shown in fig. (A) Earth work excavation in foundation (B) Cement concrete in foundation (C) 1st Class Brick work in foundation &plinth (D) 2.5 CM Thick damp proof course.	Understand	CO 1	ACE017.04

	 			
18	Prepare an approximate estimate of the building with a plinth area of 1600sq.m with the following data. 1. Plinth area rate Rs. 8000 per sq.m 2. Add for architectural work 2.5% of the cost. 3. Add for water supply and sanitary installation at 5% of the cost. 4. Contingencies at 3% of the cost. 5. Supervision charges at 2 % of the cost.	Understand	CO 1	ACE017.04
19	A building consists of 260sq.m. of plinth area in each floor. It consists of ground and first floor, whose heights are 5m and 4.5m respectively. Calculate the cost of the building from the given data. The rates given below are same for both floors. 1. Cubic area rate – Rs. 6000 per cu.m. 2. Add for architectural work – 4% per cu.m. 3. Add for water supply 5% per cu.m. 4. Add for sanitary work 5% per cu.m. 5. Add for electrical works 6% per cu.m. 6. Add for unforeseen items 5% per cu.m. 7. Add for supervision 10% per cu.m.	Understand	CO 1	ACE017.02

20	A person is to construct a building of plinth area equal to 250sq.m. on a plot in Hyderabad at a cost of Rs. 20,00,000. The height of the building from ground level to the top roof is 3.2m and a parapet wall of height equal to 800mm is constructed on the terrace. Determine the cost of construction of similar type of the building with plinth area of 300 sq.m. in the same locality based on 1. Plinth area rate and 2. Cubical content / volume rate.	Understand	CO 1	ACE017.04
	Part - C (Problem Solving and Critical Thinking Questions)			
1	The plan represents the plan of superstructure wall of a single room building of 5 m x 4 m, and Sections represents the cross-sections of the walls with foundation shown in fig. Estimate the quantities of- (1) Earthwork in excavation in foundation, (2) Concrete in foundation, (3) Brickwork in foundation, and (4) Brickwork in superstructure.  	Understand	CO 1	ACE017.03
2	Estimate the quantities of the following items of a two roomed building from the given plan and section shown in fig. (1) Earthwork in excavation in foundation, (2) Lime concrete in foundation, (3) 1st class brickwork in cement mortar 1:6 in foundation and plinth, (4) 2.5 cm c.c. dam proof course, and (5) 1st class brickwork in lime mortar in superstructure.	Understand	CO 1	ACE017.04

	 Fig. 2-6			
3	Estimate the quantities of material required for the compound wall shown in fig for the following items. (a) Earth work excavation for foundation. (b) Brick masonry in foundation and basement in cm (1 : 8). (c) Plastering the wall above the ground level with CM (1 : 5). 	Understand	CO 1	ACE017.04

4	The plan and section of a room is given below fig, calculate the following quantities by Centre line method and long wall short wall method. (a) Earth work excavation. (b) cement concrete (1:4:8). (c) R.R Masonry for 1st and 2nd footing. d) Brick Masonry for basement. (e) Filling of basement with sand . 	Understand	CO 1	ACE017.04
5	From the fig .calculate the quantities of the following items of work. a)Earthwork excavation for all column footings. b)P.C.C(1:4:8) using 40mm metal for foundation (under columns only) c)R.C.C(1:1.5:3) using metal for all column footings upto G.L. 	Understand	CO 1	ACE017.02

6	 Fig shows the plan and section of a part of a compound wall calculate the quantity of a) Calculate concrete required for foundations. b)Brick masonry required for footing and wall.	Understand	CO 1	ACE017.04
7	Prepare a preliminary estimate of a building having plinth area equal to 2600 sq.m. Given that – 1. Plinth area rate – Rs. 8000 per sq.m. 2. Extra for architectural work – 1.5% of the building cost. 3. Extra for electrical installation – 10% of the building cost. 4. Extra for water supply and sanitary installations – 6% of the building cost. 5. Extra for other services – 8% of building cost 6. Contingencies and Supervision charges – 10 %.	Understand	CO 1	ACE017.03
8	A building consists of 260sq.m. of plinth area in each floor. It consists of ground and first floor, whose heights are 5m and 4.5m respectively. Calculate the cost of the building from the given data. The rates given below are same for both floors. 1. Cubic area rate – Rs. 6000 per cu.m. 2. Add for architectural work – 4% per cu.m. 3. Add for water supply 5% per cu.m. 4. Add for sanitary work 5% per cu.m. 5. Add for electrical works 6% per cu.m. 6. Add for unforeseen items 5% per cu.m. 7. Add for supervision 10% per cu.m.	Understand	CO 1	ACE017.01
9	Prepare an approximate estimate of a hospital building for 20 beds. The cost of construction all together for each bed is Rs 80,000/-.Determine the total cost of hospital building.	Understand	CO 1	ACE017.02
10	To prepare the rough cost estimate of a hostel building which accommodate 90 students .The cost of construction including all provisions is Rs50000/- per student .Determine the total cost of hostel building.	Understand	CO 1	ACE017.04
	UNIT-II			
	EARTHWORKS			
	Part – A (Short Answer Questions)			
1	Define Lead in Earth work.	Understand	CO 2	ACE017.05
2	Define Lift in Earth work.	Understand	CO 2	ACE017.05
3	Explain mid-sectional area method .	Understand	CO 2	ACE017.05
4	Explain mean-sectional area method.	Understand	CO 2	ACE017.05
5	Explain prismoidal formula method.	Understand	CO 2	ACE017.05
6	Explain trapezoidal rule .	Understand	CO 2	ACE017.05
7	Distinguish lead and lift.	Remember	CO 2	ACE017.05
8	Distinguish earthwork in embankment and in cutting.	Remember	CO 2	ACE017.06
9	Distinguish trapezoidal rule and prismoidal rule.	Remember	CO 2	ACE017.06
10	Draw a neat sketch for earthwork banking and describe its various terms.	Remember	CO 2	ACE017.05
11	Draw a neat sketch for earthwork cutting and describe its various terms.	Remember	CO 2	ACE017.05
12	Consider a cross section and calculate its area using trapezoidal formula.	Understand	CO 2	ACE017.05
13	Consider a cross section and calculate its area using Prismoidal formula.	Understand	CO 2	ACE017.05
14	Define the term turfing.	Remember	CO 2	ACE017.05
15	Define Borrow pits.	Remember	CO 2	ACE017.05
16	Define Spoil bank.	Remember	CO 2	ACE017.05
17	Define Dead men.	Remember	CO 2	ACE017.05
18	Define Thandoos.	Remember	CO 2	ACE017.06
19	Define Spot levels.	Remember	CO 2	ACE017.06
20	Draw the tabular form for the calculation of earthwork by Mid – ordinate method .	Remember	CO 2	ACE017.07
	Part - B (Long Answer Questions)			
1	Draw the tabular form for the calculation of earthwork with the following methods. (a) Mid – ordinate method and (b) Mean – sectional area method.	Understand	CO 2	ACE017.05

2	Explain the terms lead and lift. (b) List out the general methods for computation of earth work. Explain.	Understand	CO 2	ACE017.07
3	How do you calculate: (a) Earth work with vertical fall of the ground surface for fully in banking, fully in cutting and partly in banking cutting?	Understand	CO 2	ACE017.08
4	Calculate the quantity of earthwork by three method for 200m length for a position of road in an uniform ground the heights of bank at the two end being 1.00m&1.60m . The formation width is 10m and side slope 2:1(H:V) .Assume that there is no transverse slope.	Understand	CO 2	ACE017.05
5	Explain the terms Lead and Lift for the formation of roads and give the values of intial lead and intial lift.	Understand	CO 2	ACE017.05
6	What is a lead statement ?Explain briefly the method of finding unit rate of items.	Understand	CO 2	ACE017.05
7	The lead for the earth work excavation for a road is 5.5m. How many additional leads are to be allowed?	Understand	CO 2	ACE017.06
8	What is meant by "Lift" in earth work and explain briefly with sketch.	Understand	CO 2	ACE017.07
9	The lift for earth work excavation forming a canal embankement is 4.2m.How many additional lifts have to be provided?	Understand	CO 2	ACE017.08
10	Explain "Trapezoidal rule" and "Prismoidal rule" with usual notations..	Understand	CO 2	ACE017.05
11	Find the quantity of earth work for 1km length of road. The formation width of road is 10m. Side slopes of embankment is 2:1,depth of embankment is 2m.	Understand	CO 2	ACE017.05
12	Explain the terms lead and lift.	Understand	CO 2	ACE017.05
13	Find the volume of earth work in road embankment of length 100m, top width is 7m ,depth 3.5m and side slopes 2:1.	Understand	CO 2	ACE017.05
14	State the methods of calculating quantity of earth work.	Understand	CO 2	ACE017.06
15	Calculate the quantity of earth work,for 150m length for a portion of road in an uniform ground, height of banks at the two ends being 1.2m and 1.8m. The formation width of the road is 10m . Side slopes 2:1 by 1)Prismoidal rule 2)Mid sectional area method.	Understand	CO 2	ACE017.05
16	A canal is proposed to be excavated between two points A and B is 100m apart.If the bed width is 10m,Side slopes 1.5:1 and depth of cutting 1m and 3m at A and B. Calculate the quantity of earth work excavation by 1) Mid sectional area method. 2) Mean sectional area method.	Understand	CO 2	ACE017.07
17	Find the volume of the earth work in an embankment of length 15.0m , top width 7.0m and depth 3.5m .Side slopes are 1.5:1.	Understand	CO 2	ACE017.08
18	Find the quantity of earth work for 1km length of road , the formation width of road is 8m. Side slopes of embankment is 1.5:1 , depth of embankment is 1.5m.	Understand	CO 2	ACE017.08
19	A canal is proposed to be excavated between two points A and B which are 500m apart . If the bed width is 8m, side slopes are 2:1 and the depth of cutting is 1.2m at A and 2m at B.Calculate the quantity of earth work by mid sectional area method.	Understand	CO 2	ACE017.08
20	Calculate the quantity of earth work for 1km length for a portion of a road in an uniform ground,the heights of banks at the two ends being 1m and 1.5m . The formation width is 10m and side slopes 2H:1V. Assume there is no transverse slope by prismoidal rule method.	Understand	CO 2	ACE017.07

Part - C (Problem Solving and Critical Thinking Questions)

1	Estimate the quantity of earthwork for a portion of a road from the following data. Road width at the formation surface is 8m. Side slope 2:1 in banking & 1.5:1 in cutting. Length of the chain is 30m.	Understand	CO 2	ACE017.05

Chainage (m)	Ground level (m)	Formation level
20	71.20	70
21	71.25	Upward gradient of 1 in 250
22	70.90	
23	71.25	
24	70.80	
25	70.45	
26	70.20	
27	70.35	
28	69.10	
29	69.45	
30	69.70	

2	Calculate the quantity of earthwork by three method for 200m length for a position of road in an uniform ground the heights of bank at the two endbeing 1.00m&1.60m . The formation width is 10m and side slope 2:1(H:V) .Assume that there is no transverse slope.	Understand	CO 2	ACE017.05
3	Reduced (R.L) of a ground along the center line of a proposed road from chainage 10 to chainage 20 are given below . The formation level at the 10th chainage is 107 & the road is in downward gradient of 1 in 150 upto the chainage 14 & then the gradient change to 1 in 100 downward. Formation width of road is 10m & side slopes of banking all 2:1 (H:V). Length of chain is 30m.	Understand	CO 2	ACE017.06

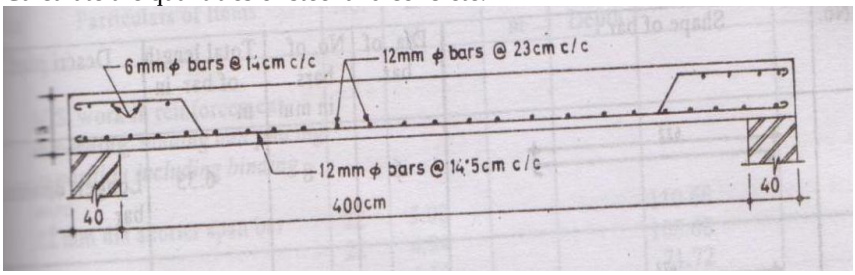
Chainage	R.L of ground.
10	105.00
11	105.60
12	105.44
13	105.90
14	105.42
15	104.30
16	105.00
17	104.10
18	104.62
19	104.00
20	103.30

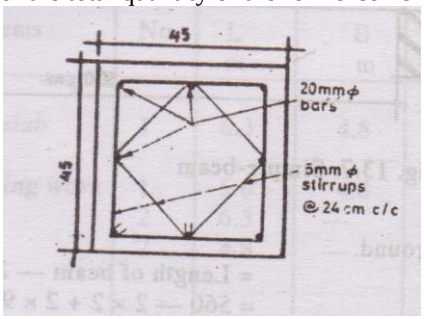
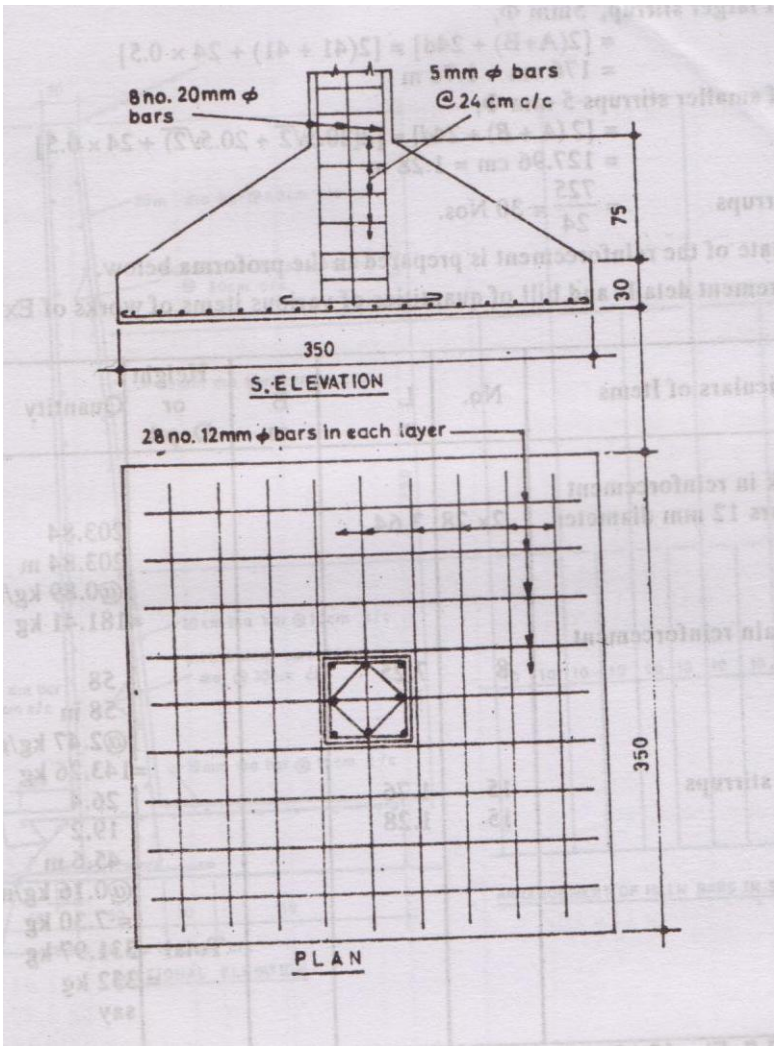
4	Estimate the cost of earthwork for a position of road for 400m length from following data . Formation width of the road is 10m . Side slope are 2:1 in banking, 1.5:1 in cutting.	Understand	CO 2	ACE017.07

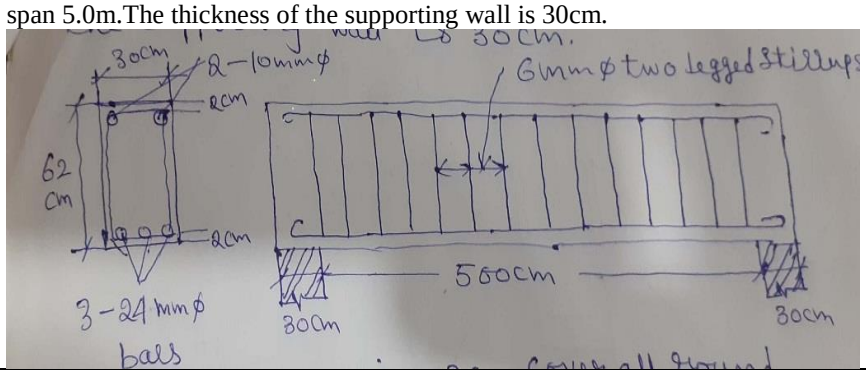
Station	Distance in m	R.L. of ground	R.L. of formation
25	1000	51.00	52.00
26	1040	50.90	Downward gradient 1 in 200
27	1080	50.50	
28	1120	50.80	
29	1160	50.60	
30	1200	50.70	
31	1240	51.20	
32	1280	51.40	
33	1320	51.30	
34	1360	51.00	
35	1400	50.60	

<table>
<tr><td>5</td><td>Explain how do you estimate the earthwork in canals for the following three cases of canal c/s
a)Fully in excavation.
b)Partly in excavation and Partly in embankment.
c)Fully in embankment .</td><td>Understand</td><td>CO 2</td><td>ACE017.08</td></tr>
<tr><td>6</td><td>Estimate the quantity of earthwork for the portion of a road from following data. Road width at the formation surface is 8m.Side slopes 2:1 in banking and 1.5:1 in cutting .Length of the chain is 30m
<table>
<tr><th>Chainage</th><th>Ground level</th><th>Formation level</th></tr>
<tr><td>20</td><td>71.20</td><td>70</td></tr>
<tr><td>21</td><td>71.25</td><td rowspan="10">Upward gradient of 1 in 200</td></tr>
<tr><td>22</td><td>70.90</td></tr>
<tr><td>23</td><td>71.25</td></tr>
<tr><td>24</td><td>70.80</td></tr>
<tr><td>25</td><td>70.45</td></tr>
<tr><td>26</td><td>70.20</td></tr>
<tr><td>27</td><td>70.35</td></tr>
<tr><td>28</td><td>69.10</td></tr>
<tr><td>29</td><td>69.45</td></tr>
<tr><td>30</td><td>69.70</td></tr>
</table></td><td>Understand</td><td>CO 2</td><td>ACE017.07</td></tr>
<tr><td>7</td><td>A canal is proposed to be excavated between two points A and B is 110m apart.If the bed width is 10m,Side slopes 1.5:1 and depth of cutting 1m and 3m at A and B. Calculate the quantity of earth work excavation by 1) Mid sectional area method. 2) Mean sectional area method.</td><td>Understand</td><td>CO 2</td><td>ACE017.05</td></tr>
<tr><td>8</td><td>Calculate the quantity of earthwork by three method for 210m length for a position of road in an uniform ground the heights of bank at the two endbeing 1.00m&1.60m . The formation width is 10m and side slope 2:1(H:V) .Assume that there is no transverse slope.</td><td>Understand</td><td>CO 2</td><td>ACE017.06</td></tr>
<tr><td>9</td><td>Calculate the quantity of earth work for 1km length for a portion of a road in an uniform ground,the heights of banks at the two ends being 1m and 1.5m . The formation width is 12m and side slopes 2H:1V. Assume there is no transverse slope by prismoidal rule method.</td><td>Understand</td><td>CO 2</td><td>ACE017.07</td></tr>
<tr><td>10</td><td>State and explain the trapezoidal rule and indicate its use.</td><td>Understand</td><td>CO 2</td><td>ACE017.08</td></tr>
<tr><td colspan="5">UNIT -III</td></tr>
<tr><td colspan="5">RATE ANALYSIS</td></tr>
<tr><td colspan="5">Part - A (Short Answer Questions)</td></tr>
<tr><td>1</td><td>What is rate analysis ?</td><td>Remember</td><td>CO 3</td><td>ACE017.09</td></tr>
<tr><td>2</td><td>Explain Job overheads .</td><td>Remember</td><td>CO 3</td><td>ACE017.10</td></tr>
<tr><td>3</td><td>Explain General overheads..</td><td>Remember</td><td>CO 3</td><td>ACE017.09</td></tr>
<tr><td>4</td><td>What are the factors affecting Rate analysis?.</td><td>Remember</td><td>CO 3</td><td>ACE017.11</td></tr>
<tr><td>5</td><td>Write the units for a)Damp proof course b)Plastering c)Brick work.</td><td>Remember</td><td>CO 3</td><td>ACE017.09</td></tr>
<tr><td>6</td><td>Write the units for Plastering & Brick work.</td><td>Remember</td><td>CO 3</td><td>ACE017.09</td></tr>
<tr><td>7</td><td>Calculate the number of workers required for 100cuft of cement concrete.</td><td>Remember</td><td>CO 3</td><td>ACE017.12</td></tr>
<tr><td>8</td><td>How much 1Cum of Portland cement weighs?</td><td>Remember</td><td>CO 3</td><td>ACE017.09</td></tr>
<tr><td>9</td><td>For 100cum of finished concrete the sum total volume of dry ingredient materials may be taken as?</td><td>Remember</td><td>CO 3</td><td>ACE017.10</td></tr>
<tr><td>10</td><td>For brickmasonry no of bricks required for 1cum.</td><td>Remember</td><td>CO 3</td><td>ACE017.09</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>11</td><td>For 10cum of brickwork , dry volume of mortar is.</td><td>Remember</td><td>CO 3</td><td>ACE017.09</td></tr>
<tr><td>12</td><td>What is Task work?</td><td>Remember</td><td>CO 3</td><td>ACE017.10</td></tr>
<tr><td>13</td><td>What is Contingencies?</td><td>Remember</td><td>CO 3</td><td>ACE017.09</td></tr>
<tr><td>14</td><td>What is work charged establishment?</td><td>Remember</td><td>CO 3</td><td>ACE017.11</td></tr>
<tr><td>15</td><td>How much contractor profit is given?</td><td>Remember</td><td>CO 3</td><td>ACE017.09</td></tr>
<tr><td>16</td><td>The rate of an item depends on?</td><td>Remember</td><td>CO 3</td><td>ACE017.12</td></tr>
<tr><td>17</td><td>Explain Rate analysis.</td><td>Remember</td><td>CO 3</td><td>ACE017.10</td></tr>
<tr><td>18</td><td>What is the dry unit weight of mortar for brick work?</td><td>Remember</td><td>CO 3</td><td>ACE017.10</td></tr>
<tr><td>19</td><td>What is the size of modular bricks?</td><td>Remember</td><td>CO 3</td><td>ACE017.10</td></tr>
<tr><td>20</td><td>What is the dry unit weight of mortar for Random rubble stone masonry?</td><td>Remember</td><td>CO 3</td><td>ACE017.11</td></tr>
</table>

Part – B (Long Answer Questions)				
1	Calculate the rate analysis for Cement concrete 1:5:10 in foundation or floor with brick ballast 40mm per cum.	Understand	CO 3	ACE017.09
2	Calculate the rate analysis for Cement concrete 1:2:4 per cum.	Understand	CO 3	ACE017.10
3	Calculate the rate analysis for R.C.C work in beams , slabs etc 1:2:4 per cum.	Understand	CO 3	ACE017.11
4	Calculate the rate analysis for R.C.C work in column 1:1.5:3 per cum.	Understand	CO 3	ACE017.09
5	Calculate the rate analysis for Reinforced brickwork (R.B. Work) on slabs 1:3 mortar per cum.	Understand	CO 3	ACE017.09
6	Calculate the rate analysis for I-Class Brick work in foundation and plinth with 20x10x10cm(nominal size) bricks with Cement sand mortar 1:6 per cum.	Understand	CO 3	ACE017.12
7	Calculate the rate analysis for I-class Brick work in Superstructure with 20x10x10 cm Brick with 1:6 Cement sand Mortar per cum.	Understand	CO 3	ACE017.09
9	Calculate the rate analysis for I-class brick work in Arches with 1:3 cement Coarse and mortar per cum.	Understand	CO 3	ACE017.11
10	Calculate the rate analysis for Random rubble masonry in super structure in 1: 6 cement sand mortar per cum.	Understand	CO 3	ACE017.12
11	Calculate the rate analysis for Coursed Rubble stone masonry in Super structure in 1:6 cement sand mortar per cum.	Understand	CO 3	ACE017.10
12	Calculate the rate analysis for Ashlar masonry in Super structure for 1:6 cement sand mortar per cum.	Understand	CO 3	ACE017.09
13	Calculate the rate analysis for 12mm Cement plastering in ceiling for 1:3 with coarse sand per cum.	Understand	CO 3	ACE017.09
14	Calculate the rate analysis for cement pointing for1:2 per 1sqm.	Understand	CO 3	ACE017.11
15	Calculate the rate analysis for 2.5cm Cement concrete floor for 1:2:4 per sqm.	Understand	CO 3	ACE017.12
16	Calculate the rate analysis for 2.5cm Cement Concrete floor for 1:1.5:3 per sqm.	Understand	CO 3	ACE017.10
17	Calculate the rate analysis for 7.5mm Thick Cement concrete for 1:4:8 in floor per cum.	Understand	CO 3	ACE017.09
18	Calculate the rate analysis for White washing one coat per sqm.	Understand	CO 3	ACE017.09
19	Calculate the rate analysis for 12mm Plastering for 1:6 per sqm.	Understand	CO 3	ACE017.12
20	Calculate the rate analysis for 12mm Plastering for 1:5 per sqm.	Understand	CO 3	ACE017.09
Part – C (Problem Solving and Critical Thinking)				
1	Calculate rate analysis for cement concrete 1:2:4 for 1cum.	Understand	CO 3	ACE017.10
2	Calculate rate analysis for RCC work in Beam , Slabs 1:2:4 for 1 cum.	Understand	CO 3	ACE017.09
3	Calculate rate analysis for I-class brick work in super structure with (20X10X10)cm brick with 1:6 cement sand motor per 1cum.	Understand	CO 3	ACE017.09
4	Describe the procedure for the calculation for rate per cum of RCC work in columns (1:1.5:3) including Steel bars, centering and shuttering.	Understand	CO 3	ACE017.12
5	Calculate Rate analysis for 12mm plastering for 1:6 cement sand mortar per sqm.	Understand	CO 3	ACE017.11
06	Calculate Rate analysis per 1Cum for course rubble stone masonry in superstructure in 1:6 cement sand mortar.	Understand	CO 3	ACE017.10
07	What are the factors affecting Rate analysis?. Explain.	Understand	CO 3	ACE017.11
08	Calculate rate analysis for I-class brick work in super structure with (20X10X10)cm brick with 1:5 cement sand motor per 1cum..	Understand	CO 3	ACE017.09
09	Describe the procedure for the calculation for rate per cum of RCC work in columns (1:1:2) including Steel bars, centering and shuttering.			ACE017.12
10	Describe the procedure for the calculation for rate per cum of RCC work in columns (1:2:4) including Steel bars, centering and shuttering.	Understand	CO 3	ACE017.11
UNIT -IV				
REINFORCEMENT BAR BENDING				
Part – A (Short Answer Questions)				
1	What is the length of one hook?	Remember	CO 4	ACE017.13
2	What is the length of 45° cranked bar?	Remember	CO 4	ACE017.14
3	What is the length of 30° cranked bar?	Remember	CO 4	ACE017.16
4	What is Debitable agency .	Remember	CO 4	ACE017.13
5	Distinguish between main reinforcement and distribution reinforcement in R.C.C slab.	Understand	CO 4	ACE017.13
6	Distinguish Straight bar and cranked bar.	Remember	CO 4	ACE017.16

7	Distinguish main reinforcement and lateral reinforcement in R.C.C column.	Understand	CO 4	ACE017.13
8	Sketch a straight bar hooked on both ends and mention the total length of bar and also length of the hooks.	Understand	CO 4	ACE017.14
9	Sketch a bar with one side straight and other side bent up hooked on both ends and mention the total length of bar and also length of the hooks.	Understand	CO 4	ACE017.16
10	Sketch a straight bar bent up and hooked on both ends and mention the total length of bar and also length of the hooks.	Understand	CO 4	ACE017.15
11	What is Penalty ?	Remember	CO 4	ACE017.16
12	How much steel is there in 1cum?.	Remember	CO 4	ACE017.16
13	What is lump-sum contract?	Remember	CO 4	ACE017.14
14	What is earnest money?	Remember	CO 4	ACE017.15
15	What is the unit weight of 20 mm ϕ bar is?	Remember	CO 4	ACE017.16
16	What is the unit weight of 12 mm ϕ bar is?	Remember	CO 4	ACE017.13
17	What is the unit weight of 16 mm ϕ bar is?	Remember	CO 4	ACE017.15
18	What is Earnest money?	Remember	CO 4	ACE017.14
19	What is Security deposit?	Remember		ACE017.15
20	What is Contract system?	Remember	CO 4	ACE017.16
Part – B (Long Answer Questions)				
1	Derive the expression for 45 degree cranked or bent up bars..	Understand	CO 4	ACE017.16
2	Derive the expression for 30 degree cranked or bent up bars.	Understand	CO 4	ACE017.16
3	What is contract and write about contractor?	Remember	CO 4	ACE017.16
4	State the important types of contracts.	Remember	CO 4	ACE017.13
5	Explain the term Earnest money deposit.	Remember	CO 4	ACE017.13
6	State the necessity of composing penalties on contractor.	Remember	CO 4	ACE017.14
7	What is tender and state the necessity of inviting tenders?	Remember	CO 4	ACE017.15
8	What is Contract document explain and State its importance.?	Understand	CO 4	ACE017.16
9	Write short note on lump-sum contract?	Understand	CO 4	ACE017.16
10	Distinguish between scheduled contract and lump-sum contract.	Understand	CO 4	ACE017.15
11	What are the conditions for termination of contract?	Understand	CO 4	ACE017.14
12	What is Item rate contract? Explain.	Understand	CO 4	ACE017.13
13	Explain the following engineering contracts along with their advantages and disadvantages. (a) Item rate contract (b) Percentage rate contract.	Understand	CO 4	ACE017.13
14	What do you mean by end anchorage, explain types of end anchorages	Understand	CO 4	ACE017.15
15	(a)Differentiate between development length in tension and compression. (b) What do you mean by development length of reinforcement?	Understand	CO 4	ACE017.15
16	Explain the following engineering contracts along with their advantages and disadvantages. (a) Item rate contract (b) Percentage rate contract.	Understand	CO 4	ACE017.16
17	What is Contract document explain and State its importance.	Understand	CO 4	ACE017.13
18	Write a short note on the following: (a) Time limits for tender notice (b) Sale of tender papers. (c) Global tender.	Understand	CO 4	ACE017.13
19	Explain the following: (a) Informal tender. (b) Opening of tenders. (c) Unbalanced tender.	Understand	CO 4	ACE017.13
20	State and explain various types of contracts for execution of works in government department.	Understand	CO 4	ACE017.13
Part – C (Problem Solving and Critical Thinking)				
1	Fig Shows the section along the shorter span of a room of size (4x5.5)m internal dimension. The thickness of the slab is 13cm. The thickness of walls is 40cm. Calculate the quantities of steel and concrete. 	Understand	CO 4	ACE017.16

2	Fig shows the details of reinforcement of a column and its footing. The length of the column from the bottom level of the footing is 605cm.Prepare the estimate of the total quantity of the reinforcement, Dimensions in Cms   	Understand	CO 4	ACE017.16
3	List and explain the various types of contracts in detail.	Understand	CO 4	ACE017.13
4	Explain contract documents in detail.	Understand	CO 4	ACE017.13
5	Explain conditions of contract.	Understand	CO 4	ACE017.13
6	What is contract document and mention the documents to be attached to the contract agreement.	Understand	CO 4	ACE017.13

7	Fig shows the longitudinal sections & Cross-sections of a simple beam of clear span 5.0m.The thickness of the supporting wall is 30cm. 	Understand	CO 4	ACE017.16
8	Explain tender notice and tender documents	Understand	CO 4	ACE017.13
9	Define the terms : Conditions of contract and Arbitration.	Understand	CO 4	ACE017.14
10	Explain the following engineering contracts along with their advantages and disadvantages. (a) Item rate contract (b) Percentage rate contract.	Understand	CO 4	ACE017.13
	UNIT -V			
	VALUATION			
	Part - A (Short Answer Questions)			
1	Define Valuation?	Remember	CO 5	ACE017.17
2	What is cost?	Remember	CO 5	ACE017.19
3	What is gross income ?	Remember	CO 5	ACE017.19
4	What are the outgoings?	Remember	CO 5	ACE017.18
5	What is sinking fund?.	Remember	CO 5	ACE017.20
6	What is scrap value?	Remember	CO 5	ACE017.19
7	Define salvage value?.	Remember	CO 5	ACE017.20
8	Define Market value?.	Remember	CO 5	ACE017.19
9	What is book value?	Remember	CO 5	ACE017.20
10	What is Rateable value?.	Remember	CO 5	ACE017.17
11	What is Obsolescence?	Remember	CO 5	ACE017.17
12	What is Capital cost?	Remember	CO 5	ACE017.17
13	What is Capitalized value?	Remember	CO 5	ACE017.18
14	What is Year's Purchase (Y.P)?	Remember	CO 5	ACE017.19
15	What is Annuity?	Remember	CO 5	ACE017.20
16	What is depreciation?	Remember	CO 5	ACE017.18
17	Explain about Municipal taxes?	Remember	CO 5	ACE017.19
18	What is mortgage lease?	Remember	CO 5	ACE017.20
19	What is Free hold property?	Understand	CO 5	ACE017.17
20	What is Lease hold property?	Understand	CO 5	ACE017.18
	Part - B (Long Answer Questions)			
1	Explain the following: (a) Sinking fund (b) Capitalised value .	Understand	CO 5	ACE017.17
2	Explain the following method of valuation of a building along with an example. (a) Valuation based on cost (b) Direct method of valuation	Understand	CO 5	ACE017.18
3	(a)Define valuation and explain the purpose of valuation. (b)Explain capitalized value with a simple example.	Understand	CO 5	ACE017.19
4	Explain the following method of valuation of a building along with an example. (a) Valuation based on cost (b) Direct method of valuation	Understand	CO 5	ACE017.20
5	Explain the factors which affect the value of the building property.	Understand	CO 5	ACE017.17
6	Explain the following method of valuation of a building along with an example. (a) Rental method of valuation (b) Direct comparison with the capital valueor not?	Understand	CO 5	ACE017.18
7	Explain different methods of valuation.	Understand	CO 5	ACE017.19
8	A pumping set with a motor has been installed in a building at a cost of Rs 2500.Assuming the life of the pump as 15 years, Workout the amount of annual instalment of sinking fund required to be deposited to accumulate the whole amount of 4% compound interest.	Understand	CO 5	ACE017.20

9	A three –storied building is standing on a plot of land measuring 800sqm. The plinth area of each storey is 400sqm . The building is of R.C.C framed structure and future life may be taken as 70 years. The building fetches a gross rent of Rs 1500 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 Rs40 per Sqm. Assume the following data. i)Repairs at 1/12 of gross income ii)Municipal tax 5% of gross rent iii)Property tax 5% of gross rent iv) Management charges @ 6% of the gross rent.v)Insurance premium @1/2% of gross rent.vi)other miscellaneous charges @ 2% of the gross rent.	Understand	CO 5	ACE017.17
10	A Coloniser intends to purchase a land of 100,000sqm area located in the suburb of a big city to develop it into plots of 700 sqm each after providing necessary roads , parks and other amenities . The current sale price of small plots in the neighbourhood is Rs30 per sqm . The colonizer wants a net profit of 20%. Work out the maximum price of the land at which the colonizer may purchase the land.Assume the following i)30%of area is deducted for roads & parks. ii)Cost of improving of land leveling & dressing @Rs0.25per sqm. iii)Cost of providing metalled roads , drainage ,water supply & electrification @Rs3.00 per sqm. iv)Engineer's & Architect's fees for surveying , planning, subdividing & supervising @3% on the sale price. v)Other miscellaneous expenses @ 1% on the sale price.	Understand	CO 5	ACE017.18
11	Explain the following a)Mortgage lease b)Freehold property	Understand	CO 5	ACE017.17
12	Explain Leasehold property ?	Understand	CO 5	ACE017.18
13	A bulking costing Rs 7, 00,000 has been constructed on a freehold land measuring 100sqm recently in a big city. Prevailing rate of land in the neighbourhood is Rs150 per sqm. Deterrmine the net rent of the property, if the expenditure on an outgoing including sinking fund is Rs24,000 per annum. Workout also the gross rent of the property per month.Assume net return on building @ 6% and on land @ 4%.	Understand	CO 5	ACE017.19
14	In a plot of land costing Rs20000 a building has been newly constructed at a total cost of Rs 80,000 including sanitary and water supply works,electrical installation.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.	Understand	CO 5	ACE017.20
15	Calculate the standard rent of a government residential building newly constructed from the following data. i)Cost of land Rs10,000 ii)Cost of construction of the building Rs40,000 iii)Cost of roads within the compound and fencing Rs2000 iv)Cost of water supply & sanitary -8% of the cost of building. v)Cost of electric installation including fans -10% of the cost of building. vi)Municipal house tax-Rs400 per annum. vii)Water tax – Rs250 per annum viii)Property tax-Rs140 per annum.	Understand	CO 5	ACE017.17
16	A building is situated by the side of a main road of lucknow city on a land of 500sqm. The built up potion in 20mx15m. The building is first class type & provided with water supply, sanitary , electric fittings & the age of building is 30 years. Work out the valuation of the property.	Understand	CO 5	ACE017.18

17	Calculate the standard rent of a government residential building newly constructed from the following data: Cost of land = Rs. 1,00,000/- Cost of construction of the building = Rs. 4,00,000/- Cost of roads within the compound and fencing= Rs. 20,000/- Cost of sanitary and water supply works = 8% of the cost of the building. Cost of electrical installation including fans = 10% of the cost of the building. Municipal house tax = Rs. 4,000/-per Annum. Water tax = Rs. 1,200/-per Annum. Property tax = Rs. 1,000/-per Annum	Understand	CO 5	ACE017.19
18	In a plot of land costing rupees 20,000. A building has been newly constructed at a total cost of 80,000. Including sanitary and water supply works, electrical installations etc. the building consists of 4 flats for 4 tenants. The owner expects 8% returns on the cost of construction and 5% return on cost of land. Calculate the standard rent for each flat of the building assuming 1. The life of the building as 60 years and sinking fund will be created on 4 % interest basis 2. Annual repairs cost at 1% cost of construction 3. Other outgoings including taxes at 30% of the net return of the building.	Understand	CO 5	ACE017.20
19	List and explain general specifications of a second class building.	Understand	CO 5	ACE017.17
20	List and explain general specifications of a first class building.	Understand	CO 5	ACE017.18
	Part – C (Problem Solving and Critical Thinking)			
1	Explain detailed specifications for earthwork	Understand	CO 5	ACE017.19
3	Explain detailed specifications for cement concrete.	Understand	CO 5	ACE017.19
4	Explain detailed specifications for brick work.	Understand	CO 5	ACE017.19
5	Explain detailed specifications for painting and polishing.	Understand	CO 5	ACE017.17
6	The present value of a property is Rs1,15.000 out of which the cost of land is Rs25,000.The owner of the property expects 7.5% return on the cost of construction and 6.5% return on the cost of land.If the future life of the building is estimated as 80 years and at the end of its useful life, Rs1,35,000 will be required for replacing the construction. Calculate the Standard rent of the property assuming a)Rate of interest for sinking fund is 5%. b) Annaual repairs cost 1% of the cost of construction. c) All other outgoing taxes shall be 30% of the net annual income of the property. d) The scrap value of building at the expiry of its useful life is estimated as 10% of the present value.	Understand	CO 5	ACE017.18
7	List and explain standard specifications of a first class building. .	Understand	CO 5	ACE017.19
8	Give the detailed specifications Earthwork in excavation in foundation	Understand	CO 5	ACE017.20
9	Give the detailed specifications cement concrete (1:2:4)	Understand	CO 5	ACE017.19
10	Give the detailed specifications Reinforced cement concrete(R.C.C)	Understand	CO 5	ACE017.17

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