

Time: 3 Hours

Max Marks: 60

Answer ONE Question from each Unit

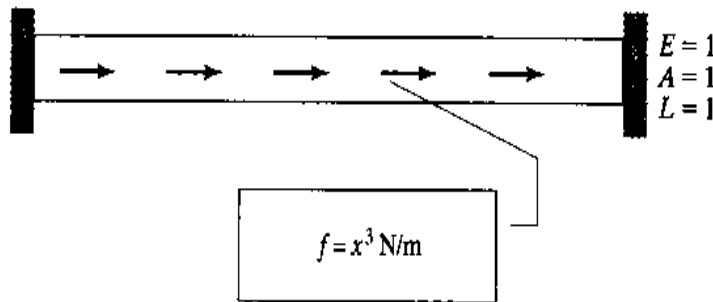
All Questions Carry Equal Marks

All parts of the Question must be answered at one place

**UNIT-I**

Marks	CO	Blooms Level
-------	----	--------------

- |    |   |     |     |    |
|----|---|-----|-----|----|
| 1. | Using Rayleigh Ritz Method, Determine the displacement and stress distribution across the element subjected to a body force $f$ . | 10M | CO1 | L3 |
|----|---|-----|-----|----|

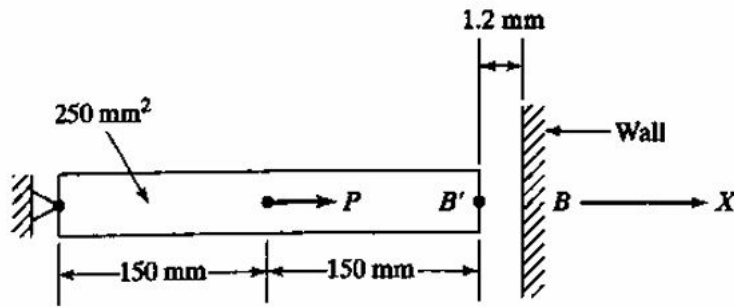


(OR)

- |       |  |    |     |    |
|-------|--|----|-----|----|
| 2. a) | A displacement field is imposed on a FE element as $u = 1 + 3x + 4x^3 + 6xy^2$ ; $v = xy - 7x^2$ . Write down the expressions for $\epsilon_{xx}$ , $\epsilon_{yy}$ , and $\epsilon_{xy}$ , and find the values of three strain components at point (0,0). | 6M | CO1 | L3 |
| b)    | In a plane strain problem, we have, $\sigma_x = 20000 \text{ psi}$ , $\sigma_y = -10000 \text{ psi}$ , $E = 3 \times 10^7 \text{ psi}$ , and $\nu = 0.3$ . Determine the value of the stress $\sigma_z$ .  | 4M | CO1 | L2 |

## UNIT-II

3. Find the Displacements and stresses in the structure shown in Fig assuming load  $P = 60 \times 10^3 \text{ N}$  and  $E = 20 \times 10^3 \text{ N/mm}^2$  10M CO2 L4

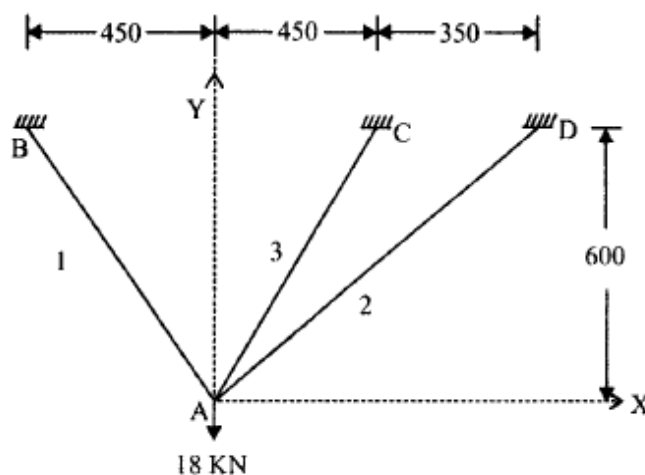


(OR)

4. a) Derive the shape functions and element strain displacement matrix (B-Matrix) for a 1D bar element. 5M CO2 L3
- b) Starting from the first principles, derive the stiffness matrix (K-Matrix) for a 1D bar element. 5M CO2 L3

## UNIT-III

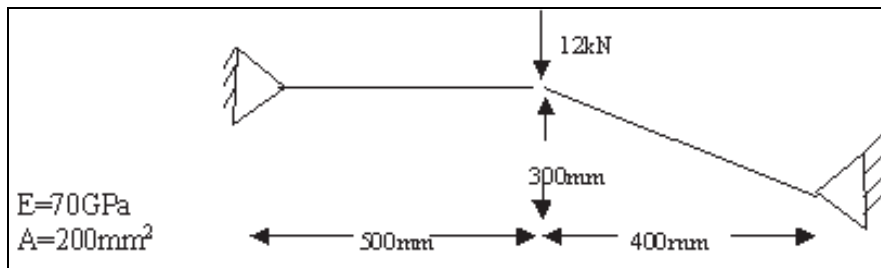
5. Determine the Displacements, stresses and support reactions for the truss as shown in Fig. 10M CO3 L4



$$A = 250 \text{ mm}^2 ; E = 200 \text{ GPa}$$

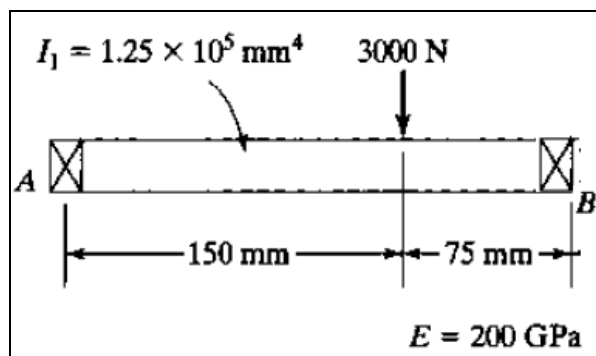
(OR)

6. a) Derive the transformation matrix (L-Matrix) **3M CO3 L3**  
for local to global nodal displacements for a  
plane truss element.
- b) Determine the displacements at nodes in the tr **7M CO3 L4**  
elements shown in fig.



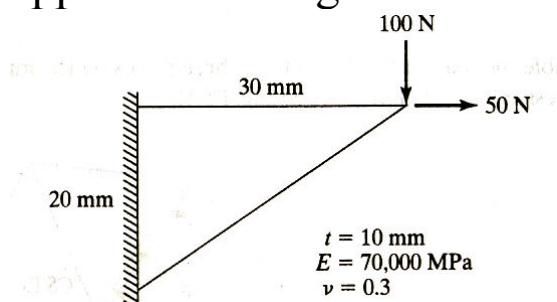
### UNIT-IV

7. Derive the Hermite shape functions for Beam **10M CO4 L3**  
Element.
- (OR)**
8. Find the deflection at the load and the slopes **10M CO4 L3**  
the ends of the steel shaft shown in figure below.  
Consider the shaft to be fixed at its ends.



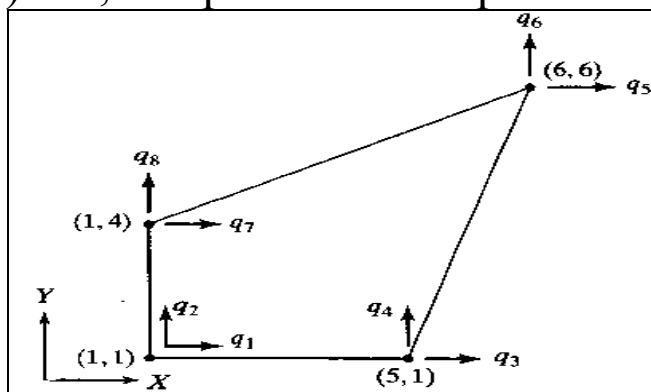
### UNIT-V

9. For the configuration shown in fig. **10M CO5 L4**  
determine the deflection at the point of load  
application using a one CST element model.



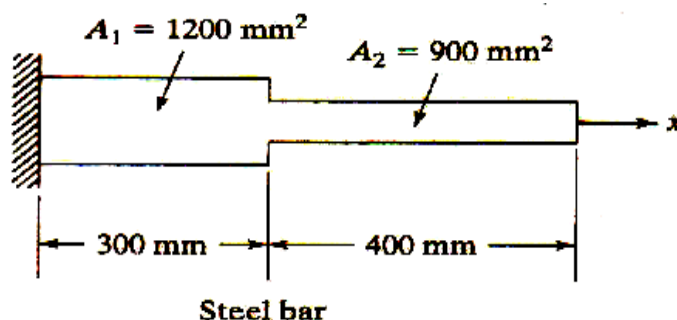
**(OR)**

10. a) Derive the sample weight functions for a Gaussian 2 point formula. 4M CO5 L2
- b) The element displacement vector of 4 node quadrilateral is given by  $q = [0, 0, 0.20, 0, 0.15, 0.10, 0, 0.05]^T$  for the nodes 1,2,3,4 at (1,1) , (5,1) , (6,6) , (1,4) respectively then find
- i) The coordinates of point P for whose  $\xi = 0.5$  and  $\eta = 0.5$
- ii)  $u, v$  displacements at point P



### UNIT-VI

11. Determine the Eigen values and Eigen vectors for the Structure as shown in Fig Consider  $E = 200 \text{ GPa}$ , Density =  $7830 \text{ kg/m}^3$  10M CO6 L5



(OR)

12. a) Derive the consistent mass matrix for 5M CO6 L3
- i) 1 D bar element
- ii) 2D Hermite beam
- b) Describe the properties of eigen values and eigen vectors. 5M CO6 L2

**Internet of Things  
(INFORMATION TECHNOLOGY)****Time: 3 Hours****Max Marks: 60**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

		<u><b>UNIT-I</b></u>	Marks	CO	Blooms Level
1.	a)	Define the Internet of Things (IoT). List and explain three major characteristics of IoT.	5	CO1	K1
	b)	Discuss the importance of IoT enabling technologies with suitable examples.	5	CO1	K2
		<b>(OR)</b>			
2.		Discuss the challenges involved in designing both the physical and logical architecture of IoT systems for large-scale deployment. Suggest solutions for at least two challenges.	10	CO1	K3
		<u><b>UNIT-II</b></u>			
3.	a)	Explain the role of Machine-to-Machine (M2M) communication in IoT.	5	CO2	K1
	b)	What is SDN? How does SDN enhance IoT networks?	5	CO2	K2
		<b>(OR)</b>			
4.		Describe, with diagrams if necessary, how NETCONF-YANG is used for IoT system management. Discuss its strengths and limitations.	10	CO2	K2
		<u><b>UNIT-III</b></u>			
5.	a)	List the 10 steps of IoT platform design methodology as discussed in your syllabus.	5	CO3	K1
	b)	Explain how Python is used in Raspberry Pi-based IoT projects.	5	CO3	K2
		<b>(OR)</b>			
6.		Propose a design for a Smart Agriculture IoT system using Raspberry Pi, covering both hardware and software components. Highlight challenges and possible workarounds.	10	CO3	K3
		<u><b>UNIT-IV</b></u>			
7.		Discuss the roles of cloud platforms such as AWS and Xively in IoT data management and application deployment. Provide examples.	10	CO4	K2
		<b>(OR)</b>			
8.	a)	Explain the function of WAMP protocol in IoT and illustrate with a use case.	5	CO4	K2
	b)	What are the advantages of using Django in IoT web applications?	5	CO4	K2
		<u><b>UNIT-V</b></u>			
9.	a)	Explain the significance of using Apache Hadoop for IoT data analysis.	5	CO5	K1
	b)	What is MapReduce? How does it support large-scale IoT analytics?	5	CO5	K2
		<b>(OR)</b>			
10.		Compare and contrast Apache Spark and Apache Storm for real-time IoT data analysis scenarios. When would you choose one over the other?	10	CO5	K3
		<u><b>UNIT-VI</b></u>			
11.	a)	List and explain at least three common IoT vulnerabilities.	5	CO6	K1
	b)	Describe solutions to mitigate these vulnerabilities in deployed IoT systems.	5	CO6	K2
		<b>(OR)</b>			
12.		Analyze the layered attacker model in IoT security. Suggest strategies for secure identity and access management in IoT environments.	10	CO6	K3

**Time: 3 Hours****Max Marks: 60**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

		Marks	CO	Blooms Level
<b><u>UNIT-I</u></b>				
1.	Define managerial economics. Explain the nature and scope of managerial economics.	10	1	2
<b>(OR)</b>				
2. a)	Describe the law of demand. Explore the exceptions to the law of demand.	5	1	2
b)	Examine the factors governing demand forecasting.	5	1	3
<b><u>UNIT-II</u></b>				
3. a)	Explain the production function with one variable input.	5	2	2
b)	Graphically explain the concept of break-even analysis.	5	2	3
<b>(OR)</b>				
4. a)	Explain the fixed and variable costs with examples.	5	2	2
b)	Analyze the least cost combination of inputs.	5	2	4
<b><u>UNIT-III</u></b>				
5.	Discuss the features of perfect competition. Explain the price-output determination in case of perfect competition.	10	3	2
<b>(OR)</b>				
6.	Define pricing. Examine the different pricing strategies.	10	3	3
<b><u>UNIT-IV</u></b>				
7. a)	Discuss the Taylor's Scientific Management Theory.	5	4	2
b)	Explain the Douglas McGregor's Theory X and Y.	5	4	2
<b>(OR)</b>				
8. a)	Define management. Explain the importance of management.	5	4	2
b)	Explore the important leadership styles.	5	4	2
<b><u>UNIT-V</u></b>				
9. a)	Define marketing. Explain the functions of marketing.	5	5	2
b)	Discuss the marketing strategies based on product lifecycle.	5	5	2
<b>(OR)</b>				
10. a)	Outline the different channels of distribution.	5	5	2
b)	Analyse the importance of digital marketing.	5	5	4
<b><u>UNIT-VI</u></b>				
11. a)	Explore the procedure involved in manpower planning.	5	6	2
b)	Analyse the methods of training and development.	5	6	4
<b>(OR)</b>				
12. a)	Distinguish between HRM and PMIR.	5	6	3
b)	Discuss the significance of wage and salary administration.	5	6	2

**Time: 3 Hours****Max Marks: 60**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

		Marks	CO	Blooms Level
<b><u>UNIT-I</u></b>				
1.	a) Demonstrate Model for Network security with a neat diagram?	5 M	1	K2
	b) Apply Playfair cipher with the Key word "KEYWORD" and encrypt the following plaintext "ALLTHEBEST".	5 M	1	K3
<b>(OR)</b>				
2.	a) Describe how a Buffer Overflow attack occurs and suggest preventive measures.	5M	1	K2
	b) Apply the Caesar Cipher technique to encrypt the word "NETWORK" using a key of 3.	5M	1	K3
<b><u>UNIT-II</u></b>				
3.	a) Explain the DES encryption algorithm.	5 M	2	K2
	b) Explain the strength of the DES.	5 M	2	K3
<b>(OR)</b>				
4.	a) Discuss the main features and advantages of the Blowfish algorithm.	5M	2	K2
	b) List and explain any three Cipher Block Modes of Operation.	5M	2	K2
<b><u>UNIT-III</u></b>				
5.	a) Users A and B use the Diffie-Hellman key exchange technique with a common prime $q = 11$ and a primitive root $a = 2$ i) If user A has public key $Y_A = 9$ , what is A's private key $X_A$ ? If user B has public key $Y_B = 3$ , what is B's private key $X_B$ ?	5 M	3	K2
	b) Outline Simple Authentication Dialogue of Kerberos Version 4.	5 M	3	K2
<b>(OR)</b>				
6.	a) Explain different approaches to Message Authentication.	5M	3	K2
	b) Describe the structure and fields of an X.509 Authentication Certificate.	5M	3	K2
<b><u>UNIT-IV</u></b>				
7.	a) Discuss about S/MIME in detail.	5 M	4	K2
	b) Explain SHA-1 algorithm.	5 M	4	K3
<b>(OR)</b>				
8.	a) Describe the different MIME Transfer Encodings and their purpose.	5M	4	K2
	b) Evaluate the role of digital signatures in S/MIME for secure message exchange.	5M	4	K5
<b><u>UNIT-V</u></b>				
9.	a) Describe various combinations of Security Associations with neat diagrams.	5 M	5	K2
	b) Write short notes on i) Virus ii) Worms iii) Bacteria	5 M	5	K2
<b>(OR)</b>				
10.	a) Define a Computer Virus and explain its lifecycle.	5 M	5	K1
	b) Compare Packet Filtering, Stateful Inspection, and Application Gateway Firewalls.	5 M	5	K4
<b><u>UNIT-VI</u></b>				
11.	a) Define the goal of each phase in the SSL Handshake Protocol.	5 M	6	K2
	b) Explain about the alert protocol process in detail.	5 M	6	K2
<b>(OR)</b>				
12.	a) Provide an overview of the SET protocol and its objectives.	5 M	6	K1
	b) Evaluate the limitations of SET protocol in modern e-commerce.	5 M	6	K5

Answer ONE Question from each Unit

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All parts of the Question must be answered at one place

<b><u>UNIT-I</u></b>		<b>Marks</b>	<b>CO</b>	<b>Blooms Level</b>
1.	a) Describe the four branches of machine learning — supervised, unsupervised, self-supervised, and reinforcement learning	5M	CO1	L2
	b) Explain step-by-step how deep learning models learn from data. describe the training cycle until convergence.	5M	CO1	L3
<b>(OR)</b>				
2.	a) Applying weight regularization (L1, L2), Define overfitting and underfitting in machine learning	5M	CO1	L2
	b) Discuss the historical evolution of machine learning before deep learning, covering: <ul style="list-style-type: none"> <li>• Probabilistic modeling</li> <li>• Kernel methods</li> </ul>	5M	CO1	L3
<b><u>UNIT-II</u></b>				
3.	a) Define Natural Language Processing (NLP) and describe its working process. Give examples of industrial applications	5M	CO2	L4
	b) Discuss the importance of non-linear activation functions in neural networks. Compare threshold, sigmoid, and ReLU functions,	5M	CO2	L4
<b>(OR)</b>				
4.	a) Describe how it adjusts weights and compare optimizers like SGD, RMSprop, and Adam.	5M	CO3	L3
	b) Explain single layer perceptron -working, limitations (such as inability to model XOR), and how multi-layer perceptron solve these limitations.	5M	CO2	L3



### **UNIT-III**

5. Describe the step-by-step process of building and training a binary classification model using the IMDB movie review dataset in Keras, including data loading, preprocessing, model building, training, and evaluation. 10M CO3 L3

**(OR)**

6. a) Discuss at least three different loss functions and their applications (binary cross-entropy, categorical cross-entropy, mean squared error) 5M CO3 L4  
b) Describe how it adjusts weights and compare optimizers like SGD, RMSprop, and Adam. 5M CO3 L3

### **UNIT-IV**

7. a) Describe the basics of RNN implementation in PyTorch. 5M CO4 L3  
b) Explain the use of CNN in PyTorch. 5M CO4 L3

**(OR)**

8. Explain the concept of convolutional neural networks and representation learning 10M CO3 L4

### **UNIT-V**

9. a) Describe deep reinforcement learning and its applications 5M CO5 L4  
b) Explain the working of generative adversarial networks 5M CO5 L3

**(OR)**

10. a) Discuss interactive applications of deep learning in machine vision and NLP. 5M CO5 L4  
b) Give an example of applying deep learning in real-world interactive systems 5M CO5 L4

### **UNIT-VI**

11. a) Compare deep belief networks with other generative models. 5M CO6 L4  
b) Describe restricted Boltzmann machines with their applications 5M CO6 L4

**(OR)**

12. a) Discuss deep generative models including Boltzmann machines and deep belief networks. 5M CO6 L3  
b) Explain the architecture and working of autoencoders 5M CO6 L2

**Time: 3 Hours****Max Marks: 60**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

		Marks	CO	Blooms Level
<b><u>UNIT-I</u></b>				
1.	a) Differentiate Ordered List and Unordered List in HTML with an example.	5	CO1	K2
	b) What are the different ways of applying CSS to an HTML document?	5	CO1	K3
<b>(OR)</b>				
2.	a) List and explain different elements and attributes used in HTML table creation.	5	CO1	K3
	b) How does CSS resolve conflicts when multiple style rules apply to the same element?	5	CO1	K2
<b><u>UNIT-II</u></b>				
3.	a) Explain the role of JavaScript in web development. What are its key features?	5	CO2	K2
	b) Write JavaScript code to read two integers and an arithmetic operator from HTML page, evaluate that operator with given integers and display the result in HTML page.	5	CO2	K3
<b>(OR)</b>				
4.	a) Explain about JavaScript arrays in detail.	5	CO2	K2
	b) Write a JavaScript function to validate Email and Password using regular expressions.	5	CO2	K3
<b><u>UNIT-III</u></b>				
5.	a) What are the key differences between AngularJS and plain JavaScript when building interactive web pages?	5	CO3	K2
	b) Write the sample Angular JS code for creating and using Objects.	5	CO3	K3
<b>(OR)</b>				
6.	a) List and explain different states of an input field in Angular JS with an example.	5	CO3	K2
	b) What are the different string manipulating functions used in Angular JS?	5	CO3	K3
<b><u>UNIT-IV</u></b>				
7.	Explain how XML DTD and Schema will be used to validate and XML document with proper examples.	10	CO4	K3
<b>(OR)</b>				
8.	a) What are rules to create a well-defined XML document? Write an example.	5	CO4	K2
	b) Explain in details about XML DOM with an example.	5	CO4	K3
<b><u>UNIT-V</u></b>				
9.	a) List and explain different types of JDBC drivers.	5	CO5	K2
	b) Write a Servlet program to read the parameters from an HTML file.	5	CO5	K3
<b>(OR)</b>				
10.	a) Write a JDBC program to retrieve and display the data from the database.	5	CO5	K3
	b) List and explain different classes and interfaces from javax.servlet package.	5	CO5	K2
<b><u>UNIT-VI</u></b>				
11.	Explain about implicit objects of JSP in detail with an example.	10	CO6	K3
<b>(OR)</b>				
12.	a) Write a JSP program for handling HTML form data.	5	CO6	K3
	b) List and explain five scripting elements in JSP with an example.	5	CO6	K2

# AR18

**CODE: 18CET418**

## SET-2

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI  
(AUTONOMOUS)**

**IV B. Tech I Semester Supplementary Examinations, November- 2025**  
**ESTIMATION COSTING AND QUANTITY SURVEYING**  
**(CIVIL ENGINEERING)**

**Time: 3 Hours****Max Marks: 60**

## PART-A

**Answer any Three questions Part-A**

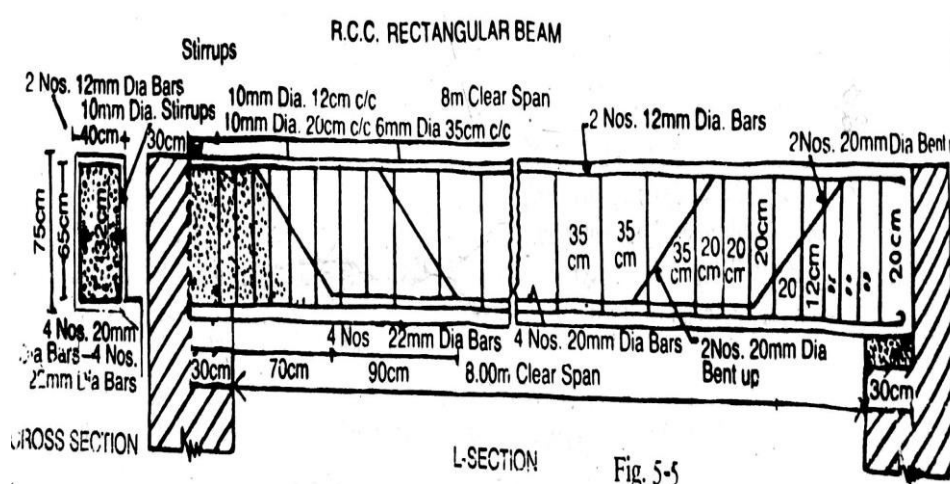
**[3 X 12 = 36 M]**

- |    |    |  |    |
|----|----|--|----|
| 1. | a) | Differentiate between detailed estimate and abstract estimate.   | 6M |
|    | b) | When do you prepare revised and supplementary estimate   | 6M |
| 2. |    | Estimate the quantity of earthwork in cutting for a road of 10m formation width with the following data using mean sectional area method or trapezoidal method. Side slope is 2:1 (H: V) and no cross slope. |    |

Chainage (meters)	0	30	60	90	120	150
Ground Level	80.50	79.30	81.40	84.00	81.00	83.0
Formation level	75.00	Rising gradient of 1 in 30				

12M

- |    |  |                     |
|----|--|---------------------|
| 3. | <p>a) Prepare the rate analysis for Cement concrete M25 grade and find the 1M<sup>3</sup> cost 1<sup>st</sup> class mason -1.5 No, 2<sup>nd</sup> class mason -2No., man mazdoor -12No, women Mazdoor 22No, water charges 1<sup>1/2</sup> % of total cost and consider the contractor profit is 10% of total cost.</p> <p>b) Prepare the rate analysis for 20mm thick cement plastering with CM (1:6).</p> | <p>6M</p> <p>6M</p> |
| 4. | <p>Prepare a detailed estimate of R.C.C beam of 8m clear span and 75cmx40cm in section from given drawings. Steel in detail and R.C.C work shall be calculate separately. also prepare a schedule of bars.</p>   |                     |



12M

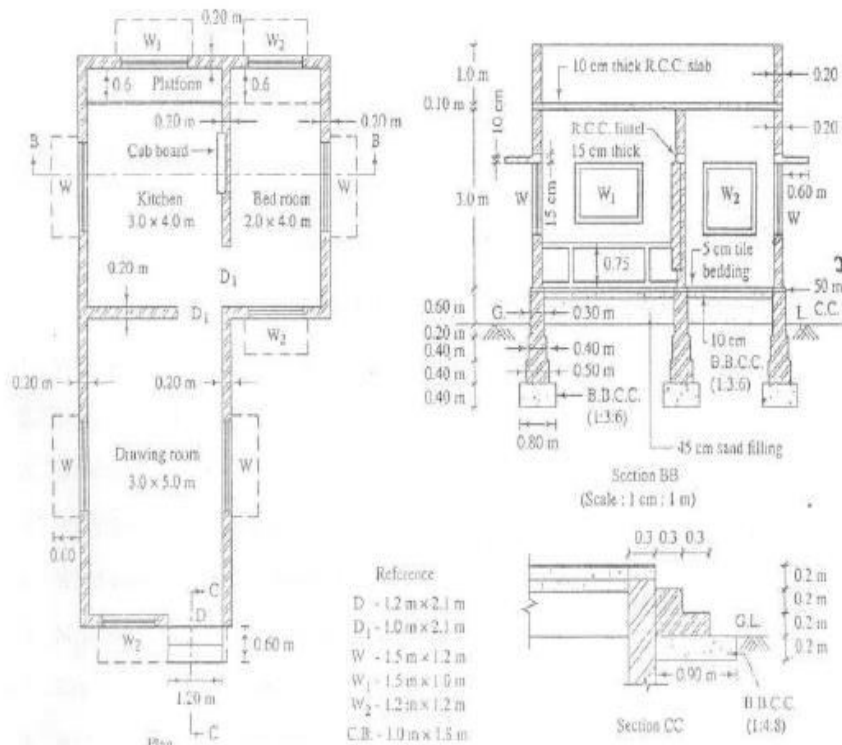
- |    |    |  |    |
|----|----|--|----|
| 5. | a) | Write a short note on Scheduling and planning with 4D BIM    | 6M |
|    | b) | Write a short note on Construction safety planning using BIM | 6M |

## PART-B

Answer any **one** question from Part-B

[1x24=24M]

6. a) Prepare an estimate of building shown in below Figure using long wall and short wall method for the following items, (i) Brick work with CM (1:6) for super structure (ii) Ceiling plastering with CM (1:3) and (iii) Inside and Outside wall painting work.

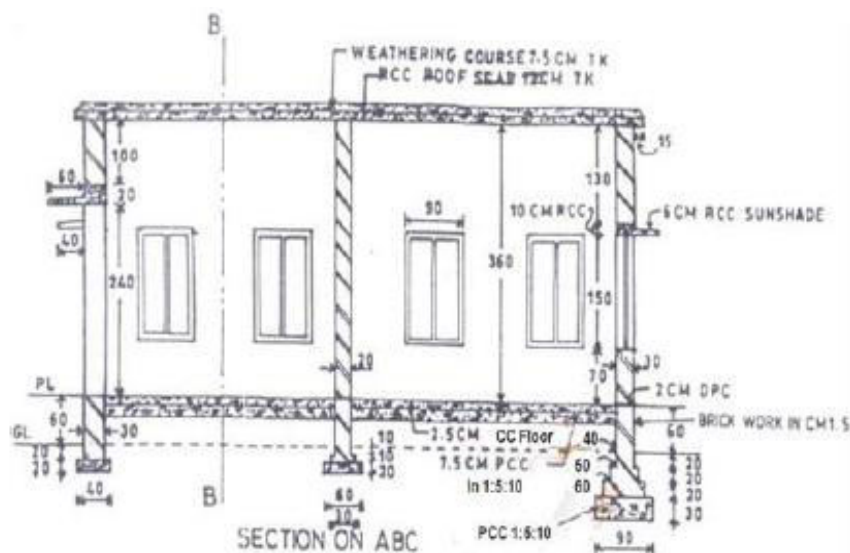


12M

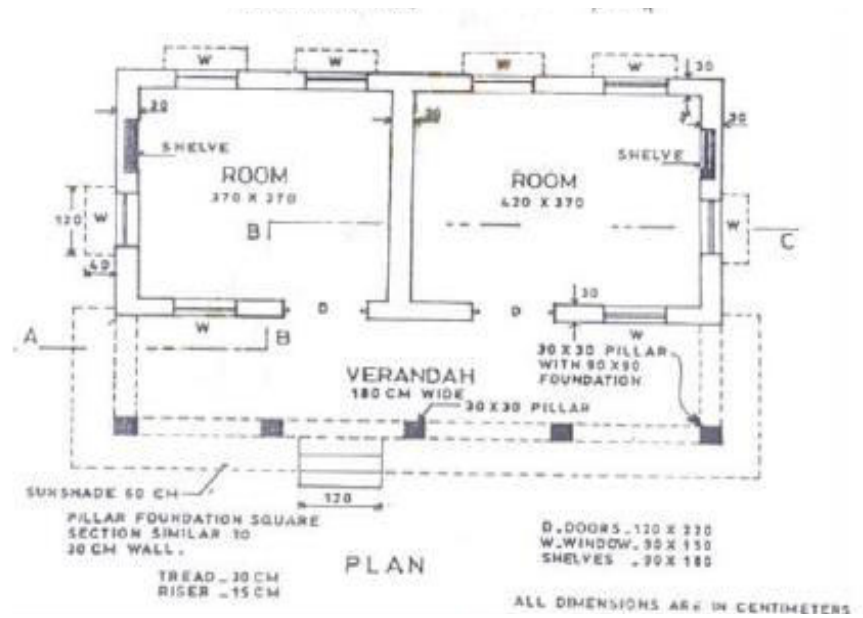
- b) Discuss about the general principles of contract document and state the purpose of penalties in contract agreement.

12M

7. a) Prepare an estimate of building shown in below Figure using long wall and short wall method for the following items, (i) Earth work excavation for foundation (ii) PCC 1:4:8 for foundation and (iii) 1<sup>st</sup> Class Brick work for super structure with CM (1:5).



12M



- b) List the components of a typical tender notice and explain about the conditions of contract.

12M