Hall Ticket Number :										

R-20

Code: 20A141T

II B.Tech. II Semester Regular & Supplementary Examinations May/June 2024

Civil Engineering Drawing

(Civil Engineering)

Max. Marks: 70 Time: 3 Hours

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PART-A

Answer *any one* question carry 28 marks

1. Draw the convention signs for Brick, Stone, Plaster, Sand filling, Concrete, Glass, Steel, Cast iron, Timber, Earth.

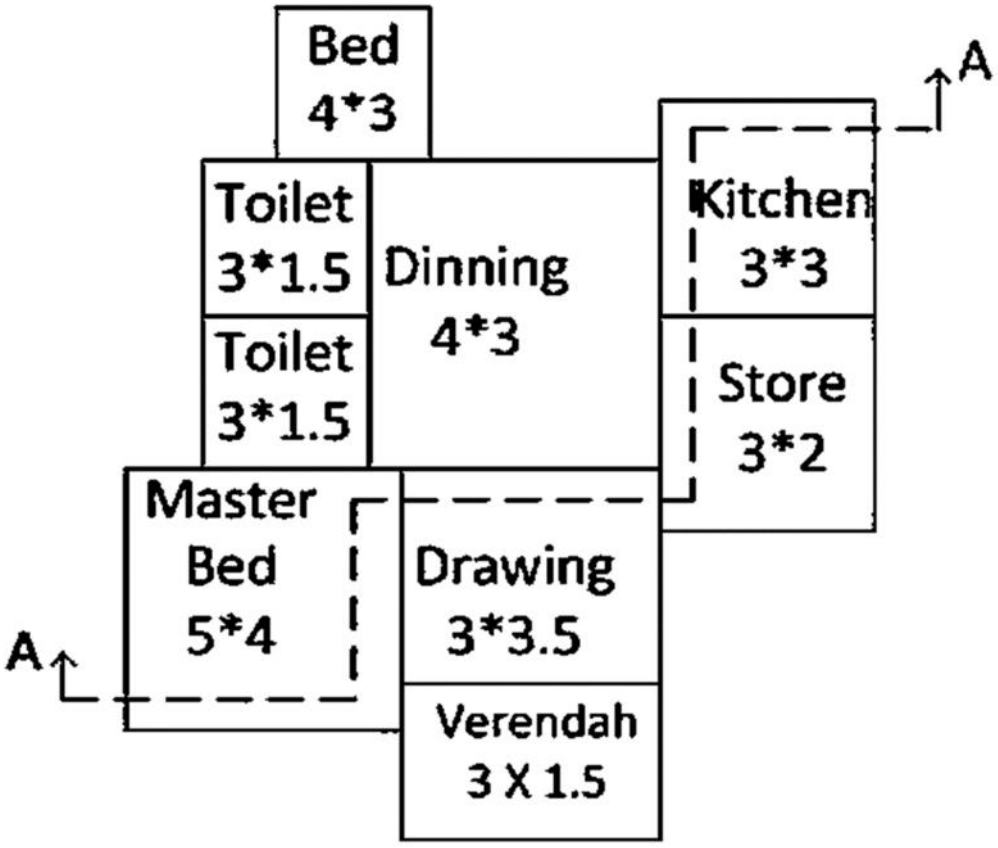
OR

2. The line sketch of the plan of a residential building is shown in Figure Draw

   (i) A neat dimensioned plan

   (ii) Sectional elevation along A-A.

   Specifications: Foundation: CC 1:3:6, 300 mm wide thick and 1200 mm wide, depth of foundation is 1000 mm below the ground level. Basement-coarse Rubble Masonry: 400 mm wide and 700 mm high Superstructure: Brickwork in CM 1:6, 300 mm wide and 300 mm high ROC roofing: 100 mm thick. Provide door, windows, ventilators, lintels and sunshades as per standard dimensions.



PART-B

Answer *Three* questions from the following (3 x 14 = 42 Marks)

		Marks	CO	BL
3.	Express various components of building as per NBC?	14M	CO1	L2
4.	Write short notes on the following: a) Building bye-laws b) FSI and carpet area c) Open spaces in buildings	14M	CO1	L1
5.	Explain in detail about the characteristics of various types residential buildings	14M	CO2	L2
6.	Describe the important departments and facilities to be provided in the layout of an industry	14M	CO2	L2
7.	How to design a building for lighting comfort, noise and acoustic comfort?	14M	CO3	L2

*** End ***

Hall Ticket Number :										

R-20

Code: 20A143T

II B.Tech. II Semester Regular & Supplementary Examinations May / June 2024

Engineering Geology

(Civil Engineering)

Max. Marks: 70 Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. In Part-A, each question carries **Two marks.**
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A

(Compulsory question)

		CO	BL
1.	**Answer ALL the following short answer questions** (5 X 2 = 10M)		
a)	Describe the disadvantages of weathering on rocks?	CO1	L1
b)	List out the physical properties used for the study of minerals?	CO2	L1
c)	Explain the use of study of textures in the rocks?	CO3	L2
d)	Discuss the effects of Earthquakes?	CO4	L2
e)	Explain why lining is required in Tunneling?	CO5	L2

PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

		Marks	CO	BL
	UNIT–I			
2.	Discuss a case study illustrating the failure of the structure is due to Geological draw backs?	12M	CO1	L2
	OR			
3.	Discuss the important branches of Geology useful in Civil engineering?	12M	CO1	L2
	UNIT–II			
4.	List out the methods used to study the minerals? Discuss their importance?	12M	CO2	L1
	OR			
5.	Explain the physical properties of : Quartz, Calcite, Augite and Biotite?	12M	CO2	L2
	UNIT–III			
6.	Briefly discuss the common textures and structures in igneous rocks?	12M	CO3	L2
	OR			
7.	Explain the classification of Faults with neat diagrams?	12M	CO3	L2
	UNIT–IV			
8.	Explain: Cone of depression, Groundwater table, Storativity and Aquifer	12M	CO4	L2
	OR			
9.	Discuss the causes, effects and control measures of Landslides?	12M	CO4	L2
	UNIT–V			
10.	Discuss the geological considerations in the selection of a Dam site?	12M	CO5	L2
	OR			
11.	Explain the effects of Tunneling on ground? Briefly discuss the Geological factors in success of a tunneling?	12M	CO5	2L

*** End ***

Hall Ticket Number :										

R-20

Code: 20A142T

II B.Tech. II Semester Regular & Supplementary Examinations May / June 2024

Materials, Testing and Evaluation

(Civil Engineering)

Max. Marks: 70 Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. In Part-A, each question carries **Two mark.**
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A

(Compulsory question)

1. Answer ALL the following short answer questions (5 X 2 = 10M) CO BL

a) How are stones classified based on their properties? 1 2

b) What are the different types of arches used in construction? 2 1

c) Discuss Abram's law and its application in concrete construction. 3 3

d) What is the modulus of elasticity in concrete, and how is it defined? 4 2

e) Define high-performance concrete (HPC) and its key attributes. 5 1

PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

Marks CO BL

UNIT–I

2. a) Evaluate the environmental impact of various methods of stone quarrying. 6M 1 3

b) Classify various types of woods used in buildings based on their properties and characteristics. 6M 1 2

OR

3. a) How do the properties of building stones affect their structural use in different types of construction? 6M 1 2

b) Identify and explain the types of tiles commonly used in construction. Provide examples of where each type is best suited and discuss their respective advantages and disadvantages. 6M 1 1

UNIT–II

4. a) Define masonry and discuss the importance of understanding different types of masonry in construction projects. 6M 2 2

b) Explain different types of footings. 6M 2 3

OR

5.	a)	Discuss the different types of staircases found in buildings. Evaluate the pros and cons of each type in terms of space efficiency and safety.	6M	2	5
	b)	Discuss the constituents of paint and the types of paints available for interior and exterior applications.	6M	2	4

UNIT–III

6.	a)	Describe the chemical composition of cement, focusing on Bogues compounds. Discuss how these compounds influence cement properties.	6M	3	3
	b)	Explain the process of mixing concrete, including factors influencing the mixing time and uniformity of the mixture.	6M	3	2

OR

7.	a)	Define hardened concrete and discuss the factors influencing its strength and durability.	6M	3	2
	b)	Define destructive and non-destructive testing methods in concrete technology. Compare and contrast their applications and significance.	6M	3	2

UNIT–IV

8.	a)	Discuss the relationship between creep and time in concrete behavior.	6M	4	2
	b)	What are statistical methods, and how are they applied in quality control of concrete?	6M	4	1

OR

9.	a)	Analyze the impact of improper mix proportions on concrete strength and durability.	6M	4	3
	b)	Write short notes on ACI method	6M	4	4

UNIT–V

10.	a)	Discuss the characteristics and applications of cellular concrete. Provide examples of where cellular concrete is commonly used in construction projects.	6M	5	1
	b)	Explain the factors affecting the properties of FRC and how fiber type and content influence its behavior.	6M	5	4

OR

11.	a)	Define polymer concrete and discuss its composition and types.	6M	5	2
	b)	Define high-performance concrete (HPC) and discuss its key characteristics and advantages.	6M	5	2

*** End ***

Hall Ticket Number :										

R-20

Code: 20AC41T

II B.Tech. II Semester Regular & Supplementary Examinations May/June 2024

Probability and Statistics

(Common to CE, ME, CSE, AI&DS, CSE(DS), CSE(AI) and AI&ML)

Max. Marks: 70 Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. In Part-A, each question carries **Two marks.**
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A

(Compulsory question)

1. **Answer ALL the following short answer questions** (5 X 2 = 10M) CO BL

a) A sample of five university students responded to the question "How much time, in minutes, did you spend on the social network site yesterday?" 100, 45, 60, 130, 30. Find the mean and the median. CO1 L1

b) What is the probability that a leap year selected at random will contain 53 Sundays? CO2 L1

c) Define Normal distribution. CO3 L2

d) Explain Type I error and Type II error. CO4 L3

e) Write χ^2 statistic for analysis of r × c table. CO5 L1

PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

Marks CO BL

UNIT–I

2. Calculate the mean and median for the following table giving the age distribution of 542 members. 12M CO1 L3

Age (in years)	20-30	30-40	40-50	50-60	60-70	70-80	80-90
No. of members	3	61	132	153	140	51	2

OR

3. The ranks of same 16 students in Mathematics and Physics are as follows. Two numbers within brackets denote the ranks of the students in Mathematics and Physics: (1,1) (2,10) (3,3) (4,4) (5,5) (6,7) (7,2) (8,6) (9,8) (10,11) (11,15) (12,9) (13,14) (14,12) (15,16) (16,13). Calculate the rank correlation coefficient for proficiencies of this group in Mathematics and Physics. 12M CO1 L4

UNIT–II

4. In a bolt factory machines A,B and C manufacture respectively 25%.35% and 40% of the total. Of their output 5, 4, 2 percent are defective bolts. A bolt is drawn at random from the product and is found to be defective. What are the probabilities that it was manufactured by machines A, B and C? 12M CO2 L2

OR

5. Let X be a continuous random variable with distribution :

$$f(x)=\begin{cases} k\,x^2 & if\ 0\le x\le 1 \\ 0 & elsewhere \end{cases}$$

(i) Evaluate k (ii) Find $p(1/4\le X\le 3/4)$. (iii) Find $p(X>2/3)$. 12M CO2 L5

UNIT–III

6. a) The probability that a patient recovers from a rare blood disease is 0.4. If 15 people are known to have contracted this disease, what is the probability that (i) at least 10 survive, (ii) from 3 to 8 survive, and (iii) exactly 5 survive? 6M CO3 L1

b) A car hires firm has two cars which it fires out day by day. Tile number of demands for a car on each day is distributed as Poisson variate with mean 1· 5. Calculate the proportion of days on which (i) neither car is used, and (ii) some demand is refused. 6M CO3 L3

OR

7. a) Out of 800 families with 5 children each, how many would you except to have (i) 3 boys (ii) either 2 or 3 boys? (iii) 5 girls. Assume equal probabilities for boys and girls. 6M CO3 L2

b) In a normal distribution, 7% of the items are under 35 and 89% are under 63. What are the mean and standard deviation of the distribution? 6M CO3 L1

UNIT–IV

8. a) The average zinc concentration recovered from a sample of measurements taken in 36 different locations in a river is found to be 2.6 grams per milliliter. Find the 95% and 99% confidence intervals for the mean zinc concentration in the river. Assume that the population standard deviation is 0.3gram per milliliter. 6M CO4 L2

b) A study showed that 64 of 180 persons who saw a photocopying machine advertised during the telecast of a baseball game and 75 of 180 other persons who saw it advertised on a variety show remembered the brand name 2 hours later. Use the Z- statistic to test at the 0.05 level of significance whether the difference between the corresponding sample proportions is significant. 6M CO4 L3

OR

9. a) If x = 36 of n = 100 persons interviewed are familiar with the tax incentives for installing certain energy-saving devices, construct a 95% confidence interval for the corresponding true proportion. 6M CO4 L3

b) In 64 randomly selected hours of production, the mean and the standard deviation of the number of acceptable pieces produced by a automatic stamping machine are $x = 1,038$ and $s = 146$. At the 0.05 level of significance, does this enable us to reject the null hypothesis $\mu = 1,000$ against the alternative hypothesis $\mu > 1,000$? 6M CO4 L5

UNIT–V

10. It is desired to determine whether there is less variability in the silver plating done by Company 1 than in that done by Company 2. If independent random samples of size 12 of the two companies' work yield $s_1 = 0.035$ mil and $s_2 = 0.062$ mil, test the null hypothesis $\sigma^2_1 = \sigma^2_2$ against the alternative hypothesis $\sigma^2_1 < \sigma^2_2$ at the 0.05 level of significance. 12M CO5 L5

OR

11. The following is the distribution of the hourly number of trucks arriving at a company's warehouse:

Trucks arriving per hour	Frequency
0	52
1	151
2	130
3	102
4	45
5	12
6	5
7	1
8	2

Find the mean of this distribution, and using it (rounded to one decimal place) as the parameter λ, fit a Poisson distribution. Test for goodness of fit at the 0.05 level of significance. 12M CO5 L6

*** End ***

Hall Ticket Number :										

R-20

Code: 20A144T

II B.Tech. II Semester Regular & Supplementary Examinations May/June 2024

Structural Analysis

(Civil Engineering)

Max. Marks: 70 Time: 3 Hours

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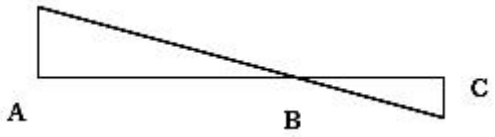
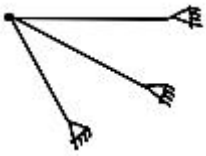
Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. In Part-A, each question carries **Two marks.**
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A

(Compulsory question)

		CO	BL
1.	Answer ALL the following short answer questions (5 X 2 = 10M)		
a)	Differentiate statistically determinate and indeterminate beam with suitable examples.	CO1	1
b)	A fixed beam of span 6 m carries a uniformly distributed load of 2 kN/m run. If E = 2 x 10^8 kN/m^2 and I = 0.48 x 10^{-4} m^4, find the bending moment at the centre and maximum deflection.	CO2	1
c)	While applying Clapeyron's theorem of three moments, a fixed end of a continuous beam is replaced by_____ (i) infinite stiffness (ii) zero stiffness (iii) infinite length (iv) infinite moment	CO3	2
d)	The ILD for a certain beam at a specific location is given in **figure**, draw the original beam structure relevant to this case marking the positions of A, B and C. 	CO4	2
e)	Calculate the degree of indeterminacy if the single jointed truss shown in **figure**. 	CO5	1

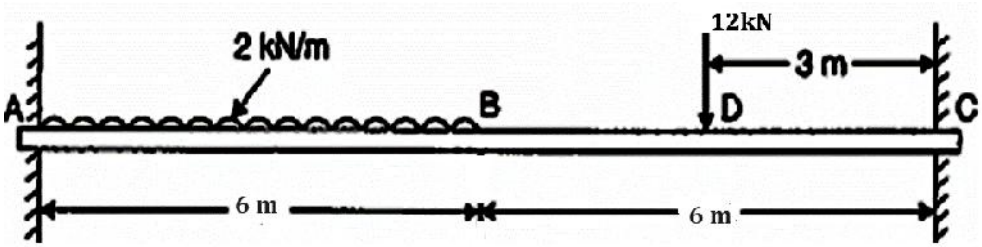
PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

		Marks	CO	BL

UNIT–I

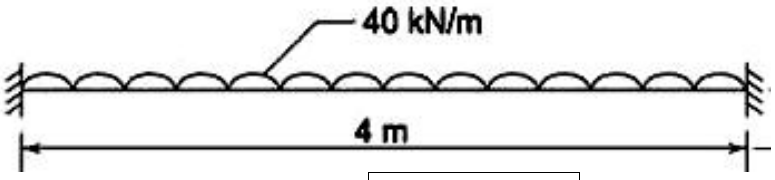
2. Analyze the fixed beam shown in **figure**. Find the fixing moments, draw the shear force and binding moment diagrams. Also compute the maximum deflection under the loads. Take E = 2 x 10^8 kN/m^2, and I = 7 x 10^8 mm^4.



12M CO1 3

OR

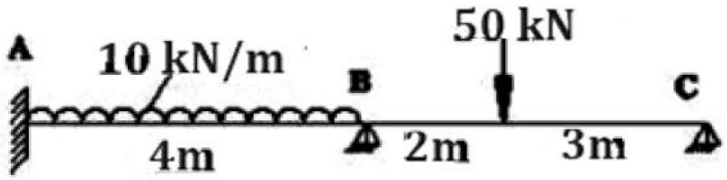
3. A fixed beam of 4 m span carries a UD load of 40 kN/m over its whole length. Compare the maximum BM in this beam with the fixed end moments due to the right support settling by 10 mm. E = 200 GN/m^2 and I = 5000 cm^4.



12M CO1 3

UNIT–II

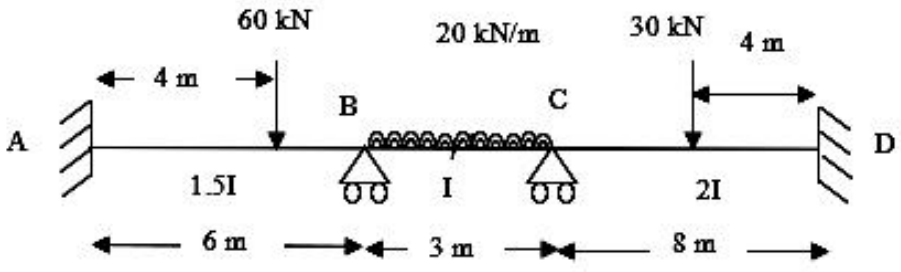
4. Analyze the beam shown in **figure** by theorem of three moments. Find the support moments and reactions. Draw the SF and BM diagrams of the beam.



12M CO2 3

OR

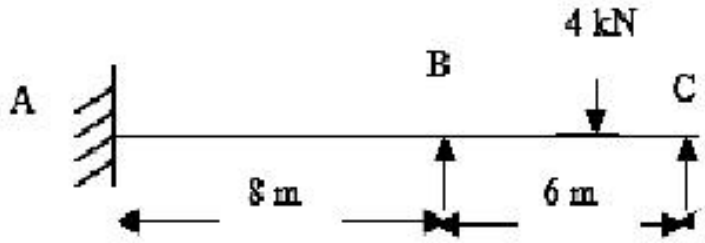
5. Analyze the beam shown in **figure** Clapeyron's theorem. Find the support reactions and moments. Draw the SF and BM diagram of the beam.



12M CO3 4

UNIT–III

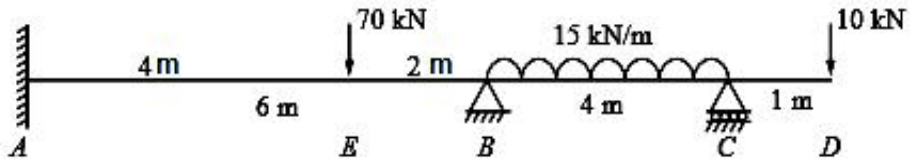
6. A continuous beam is built of constant moment of inertia is loaded as shown in **Figure**. Find the support moments and draw the bending moment diagram.



12M CO3 4

OR

7. Analyze the continuous beam shown in **figure** by moment distribution method. Draw the SF and BM diagrams.



12M CO4 4

UNIT–IV

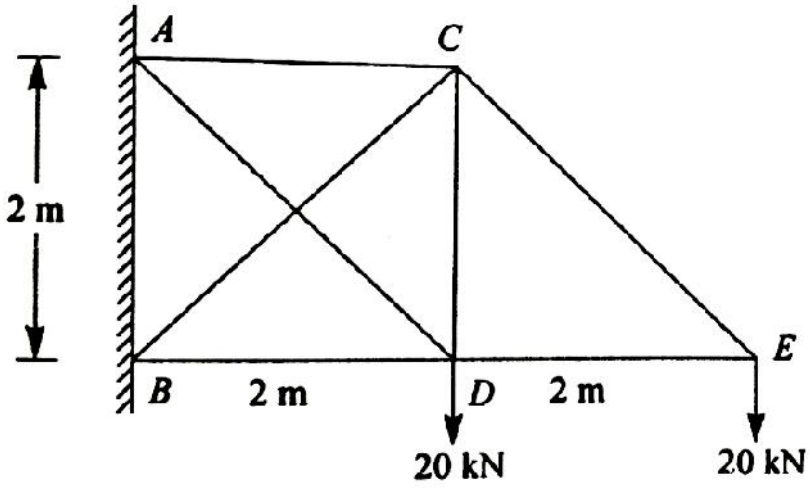
8. Four wheel loads 60, 40, 80 and 50 kN crosses a girder of 20 m span, from left to right with 60 kN load leading. The spacing between the loads in the same order are 3m, 2m and 2m. Using influence lines, calculate the maximum bending moment and shear force at 8m from the left support. 12M CO5 4

OR

9. A train of wheel loads 80 kN, 160kN, 160kN and 120 kN crosses a girder of 25m span, from left to right with 120 kN load leading. The spacing between the loads with the same order are 2m, 2m and 3m. Using ILD (a) Determine maximum bending moment at the section 8m from the left end of the girder. (b) Absolute maximum bending moment on the girder. 12M CO5 4

UNIT–V

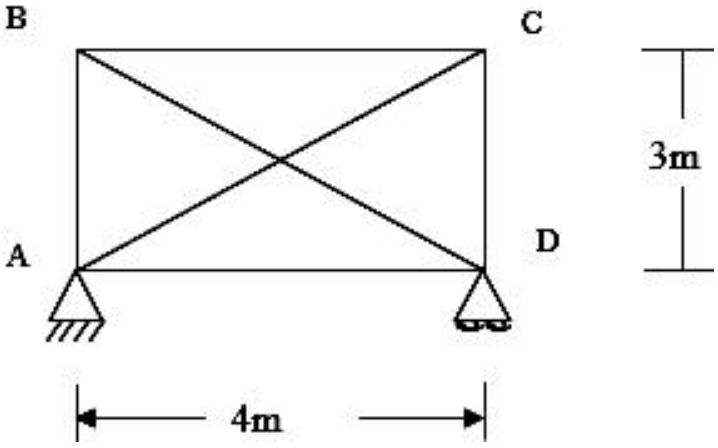
10. Find the forces in the members of the redundant frame shown in **figure** using energy methods. Cross sectional area of each member is 1000 mm^2 and E = 2 x 10^5 N/mm^2.



12M CO1 3

OR

11. **Figure** shows the frame ABCD in which it was found that the member AC was 1mm short of the required length while fabricating. Determine the forces developed when AC was forced into its position, given that the cross-sectional area of the diagonal members = 2000 mm^2, cross sectional area of the other members = 1000 mm^2 and the Young's modulus E = 200 kN/mm^2.



12M CO2 3

*** End ***