TANTA UNIVERSITY

FACULTY OF ENGINEERING

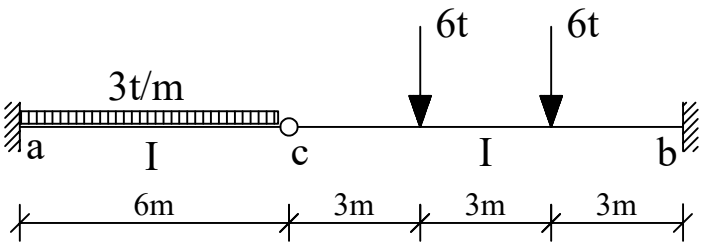
CONSTRUCTION ENGINEERING PROGRAM

FINAL EXAM

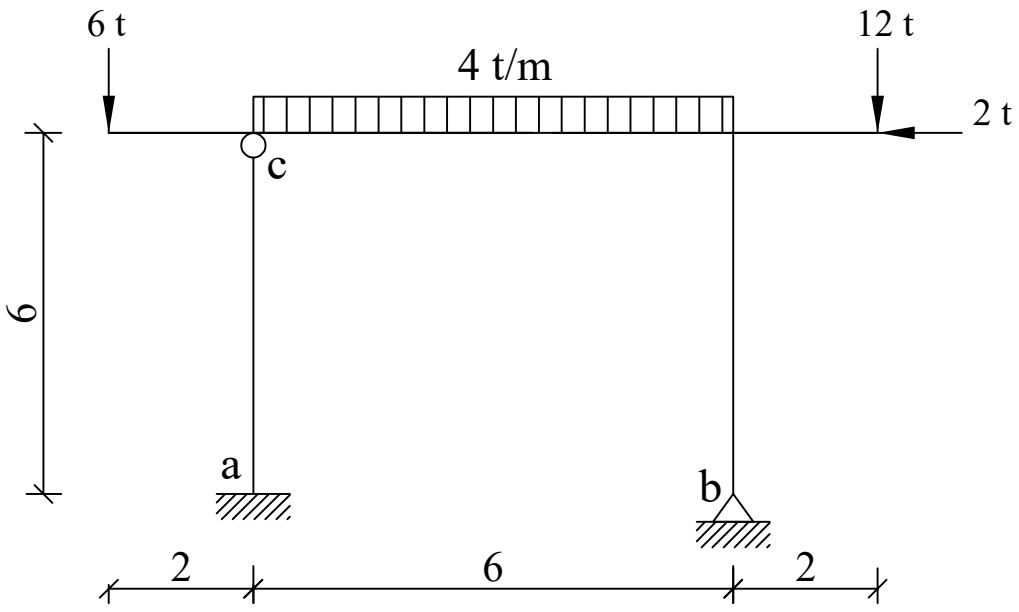
COURSE TITELE: STRUCTURAL ANALYSIS 2			COURSE CODE: CES 142
DATE :01/2023	SECOND LEVEL	TOTAL ASSESSMENT MARKES : 40	TIME ALLOWED: 3 HOURS

Systematic arrangement of calculations and clear drawing are essential. Any data not given is to be assumed
Answer as many questions as you can - Answer as brief as possible.

Q1) For the given statically indeterminate beam shown , using the " Force Method " draw the B.M.D. (10 marks)



Q2) Using the " Force Method " draw the B.M.D for the given frame of constant (EI) shown (10 marks)



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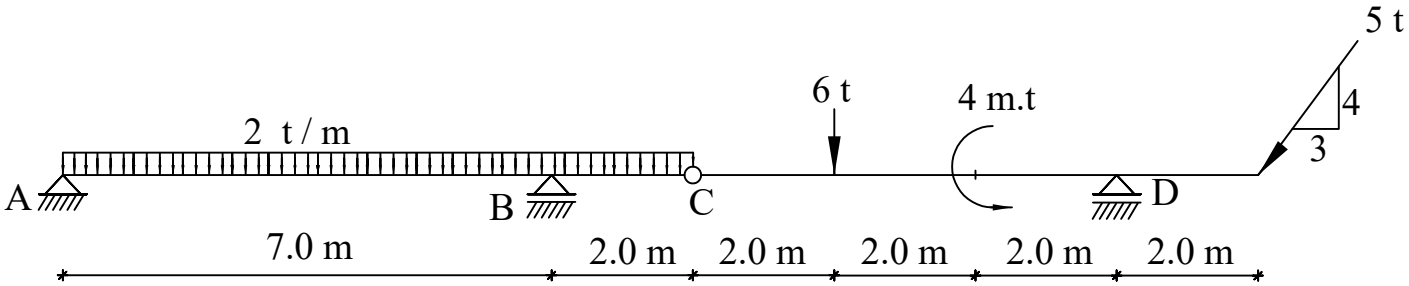
COURSE TITELE: STRUCTURAL ANALYSIS 1			COURSE CODE: CES 141
DATE :01/2023	SECOND LEVEL	TOTAL ASSESSMENT MARKES : 40	TIME ALLOWED: 3 HOURS

Systematic arrangement of calculations and clear drawing are essential. Any data not given is to be assumed
Answer as many questions as you can - Answer as brief as possible.

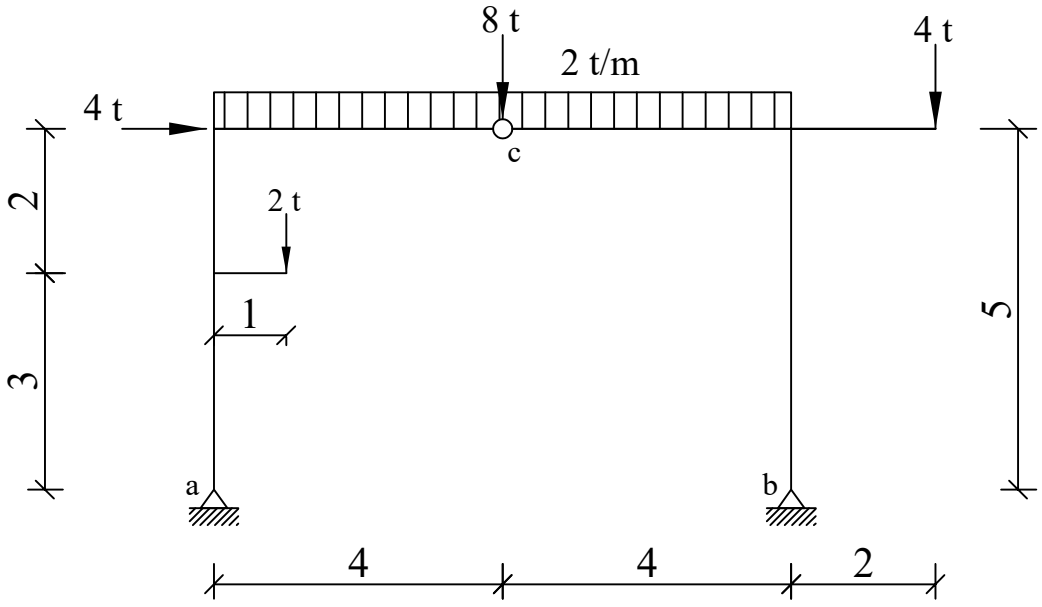
Q1) Draw the N.F, S.F, and B. M. Diagrams for the shown beam

(9 marks)



Q2) Draw the N.F, S.F, and B. M. Diagrams for the shown frame

(10 marks)



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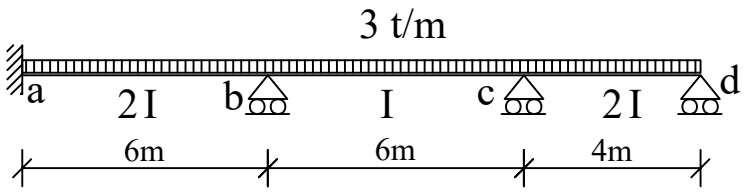
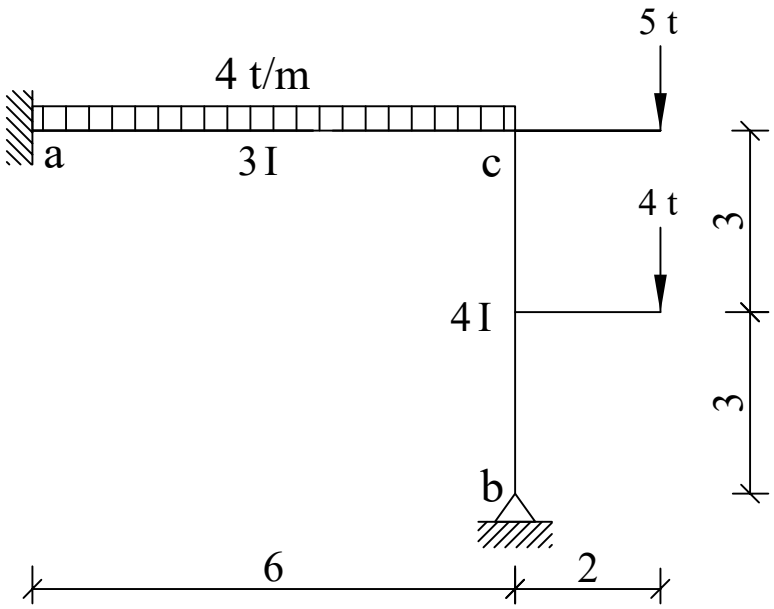
Q3) Draw the B.M.D for the shown beam using the " 3-moment equation " method . (10 marks)



Q4) Draw the B.M.D for the structure shown using the method of " Slope Deflecton" . (10 marks)

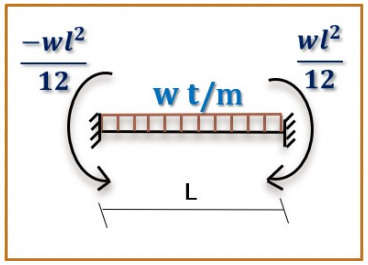


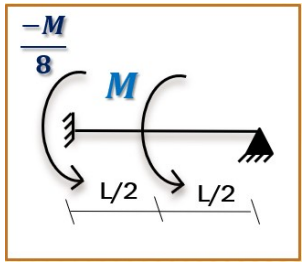
Hints:

$$M_1\left(\frac{L_1}{I_1}\right)+2M_2\left(\frac{L_1}{I_1}+\frac{L_2}{I_2}\right)+M_3\left(\frac{L_2}{I_2}\right)=-6\left(\frac{R_1^L}{I_1}+\frac{R_2^L}{I_2}\right)$$

$$M_{ab}=M_{ab}^{F}+2K_{ab}\,(2\theta_a+\theta_b-3\varphi_{ab})$$
$$M_{ba}=M_{ba}^{F}+2K_{ba}\,(2\theta_b+\theta_a-3\varphi_{ba})$$

$$M_{ab}=M_{ab}^{F}+3K_{ab}\,(\theta_a-\varphi_{ab})$$





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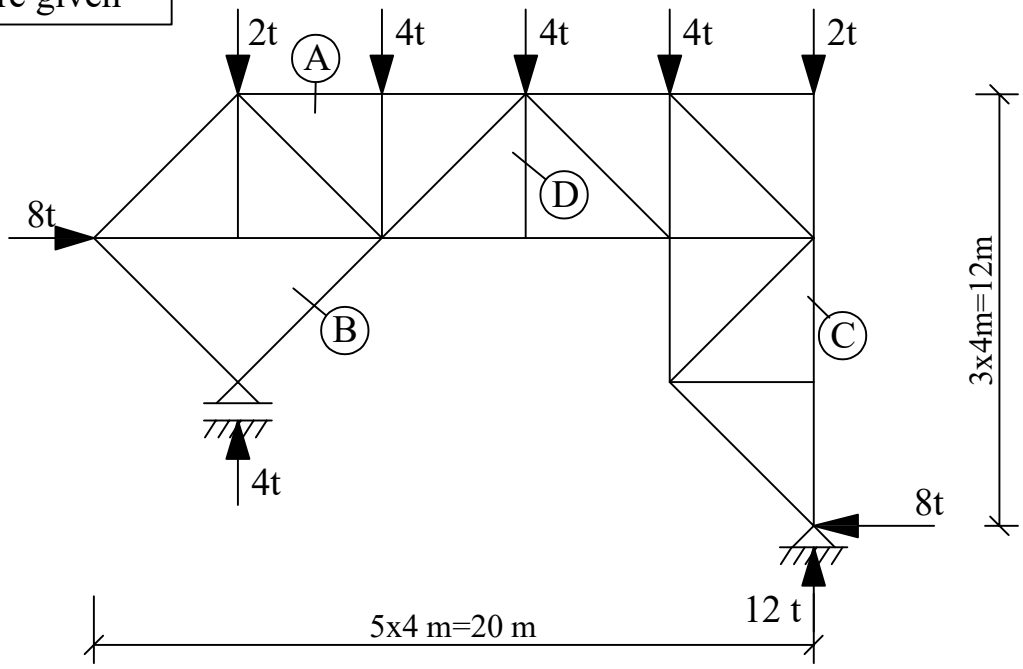
Q3) For the shown truss calculate the forces in the marked members

(7 marks)

Note: Reactions are given



Q4) The shown concrete wall carries a horizontal load H as shown in the Figure

(Own weight of concrete = 2.0 t/m^3)

(14 marks)

a) Determine the distribution of normal stresses at the base m - m if H = 8.0 t

b) Find the maximum value of H if no tension is allowed on the soil and draw the corresponding normal stress distribution on the soil