

B.Tech. SEM -IV (Civil) 2014 Course (CBCS) : WINTER - 2018
SUBJECT: STRUCTURAL ANALYSIS-I

Day: Saturday
Date: 17/11/2018

W-2018-2336

Time: 02.30 PM TO 05.30 PM
Max Marks: 60

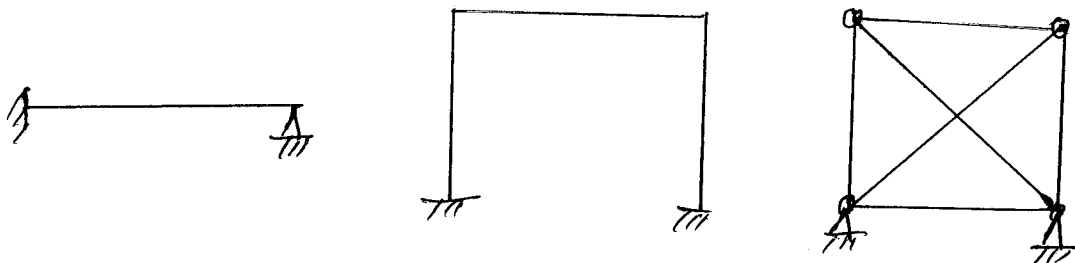
N.B.:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Assume suitable data if necessary.
- 4) Draw a neat labeled diagram **WHENEVER** necessary.

Q.1 What is strain energy? Derive strain energy equation for axial load and for (10) bending moment.

OR

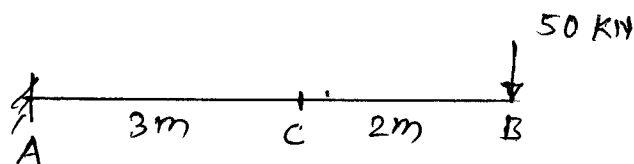
Q.1 Calculate degree of static and kinematic indeterminacy for following structures. (10)



Q.2 What is Castigliano's first theorem? Derive an equation to calculate deflection (10) of joint of truss.

OR

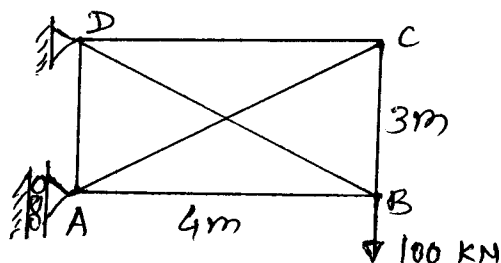
Q.2 Calculate slope and deflection at joint 'c' using conjugate beam method. (10)



Q.3 What is a redundant member? Explain how the effect of lack of fit and change in (10) temperature on truss is calculated.

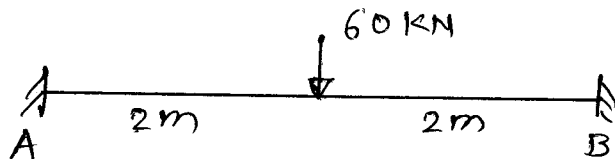
OR

Q.3 Analyse the truss shown in figure. The c/s area for horizontal, vertical and (10) diagonal members are 40, 60 and 80 mm² respectively. Take E= 200GPa



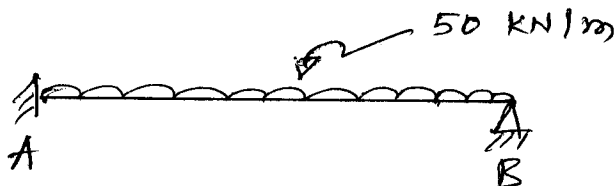
P.T.O.

Q.4 Analyse the beam shown in figure if support 'B' sink by 10mm. $EI=9000 \text{ KN.m}^2$ (10)

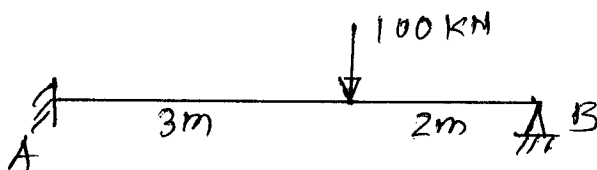


OR

Q.4 Analyse the beam shown in figure using three moment theorem (10)

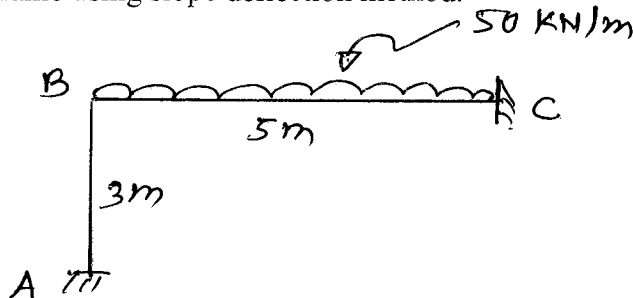


Q.5 Analyse the beam using slope deflection method. (10)



OR

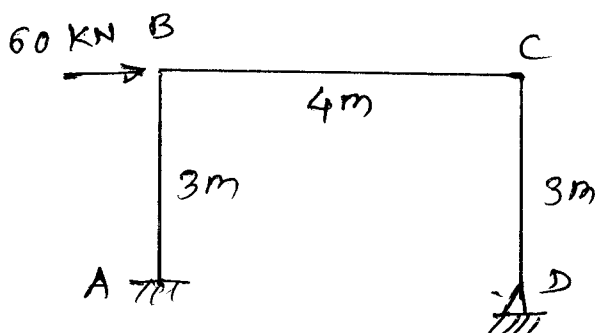
Q.5 Analyse the frame using slope deflection method. (10)



Q.6 What is flexural stiffness? Explain relative stiffness, and calculation of moment distribution factor with example. (10)

OR

Q.6 Analyse the frame using moment distribution method. (10)



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