

**B.TECH. SEM -IV (CIVIL) 2014 COURSE (CBCS) : WINTER .
2017
SUBJECT STRUCTURAL ANALYSIS – I**

Day: **Friday**
Date: **24/11/2017**

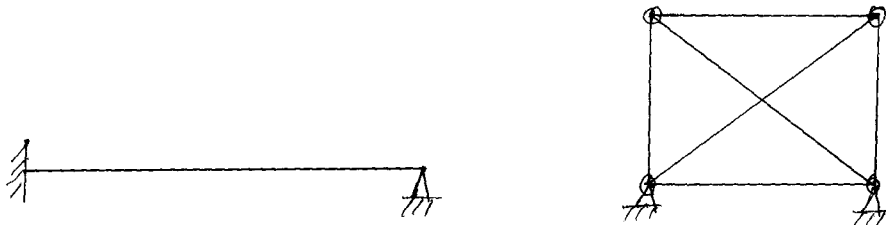
Time: **02.30 PM TO 05.30 PM**
Max. Marks: 60

W-2017-2072

N.B.:

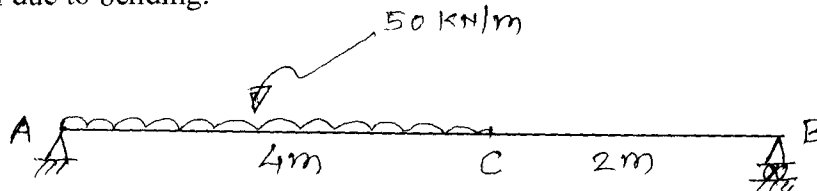
- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Draw neat labeled diagrams **WHEREVER** necessary.
- 4) Assume suitable data if necessary.

- Q.1** a) Derive an expression for strain energy stored in the member subjected to axial force. (05)
b) Calculate degree of static indeterminacy for following structures. (05)

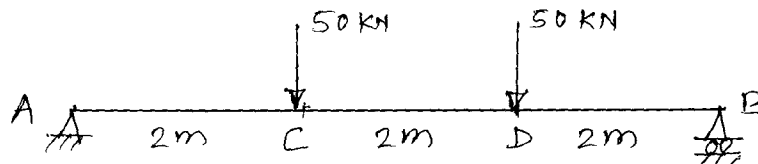


OR

- Q.1** A beam is loaded as shown in figure. Calculate total strain energy stored in the beam due to bending. (10)

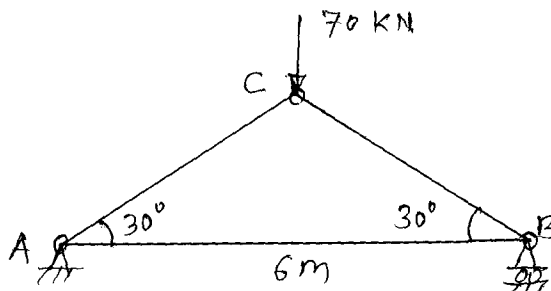


- Q.2** Calculate slope at 'A' using conjugate beam method. (10)



OR

- Q.2** Calculate vertical deflection of joint 'C' of the truss. The cross sectional area of all members is 50 mm². Take E = 200 GPa. (10)

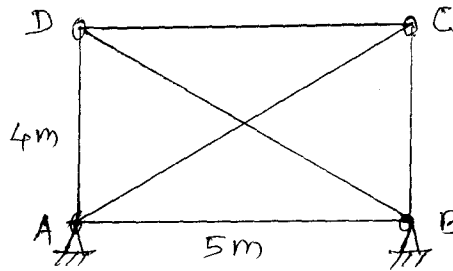


- Q.3** Derive an expression to calculate force in redundant member of the truss using Castigliano's second theorem. (10)

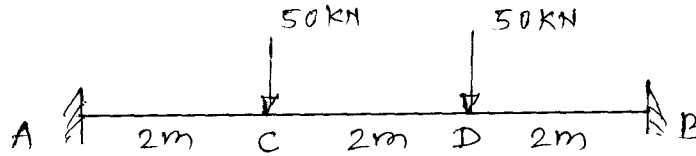
OR

P. T. O.

Q.3 Analyze the truss shown in figure if member AC is too long by 10 mm. Take C/S area of all members = 300 mm^2 , $E = 200 \text{ GPa}$. (10)



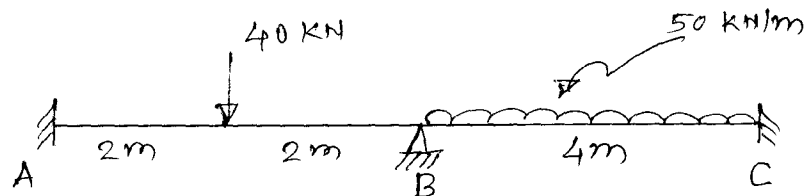
Q.4 Analyze the fixed beam shown in figure and draw BMD. (10)



OR

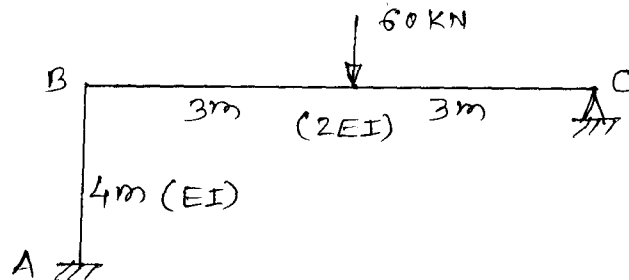
Q.4 Explain a clapeyron's theorem also explain its application and limitation with suitable examples. (10)

Q.5 Analyze the beam shown in figure using slope deflection methods if support 'C' sink by 12 mm Take $EI = 8000 \text{ kN} \cdot \text{m}^2$ (10)

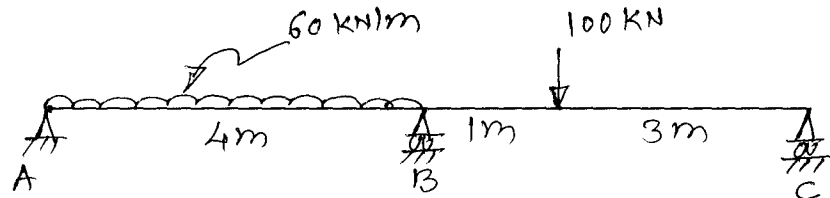


OR

Q.5 Analyze the frame shown in figure using slope deflection method. (10)



Q.6 Analyze the beam shown in figure using moment distribution method. (10)



OR

Q.6 Calculate moment distribution factor at joint 'B'. (10)

