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Total No. of Questions: 09

Total No. of Pages: 03

B. Tech. (CE) (Sem. 5)
STRUCTURAL ANALYSIS - II
Subject Code: BTCE-503
Paper ID: A2080

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. Section A is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. Section B contains **FIVE** questions carrying **FIVE** marks each and students have to attempt any **FOUR** questions.
3. Section C contains **THREE** questions carrying **TEN** marks each and students have to attempt any **TWO** questions.

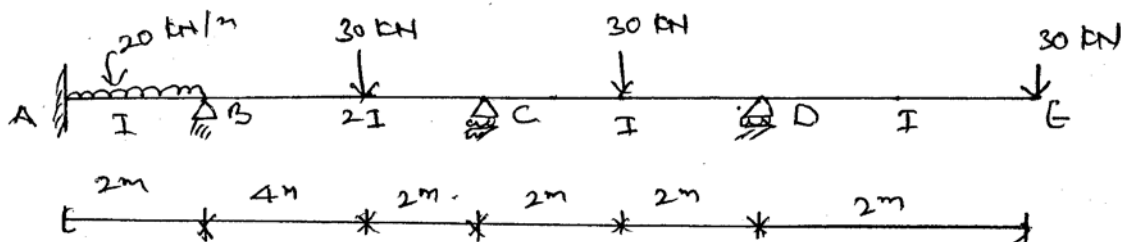
SECTION A

1.

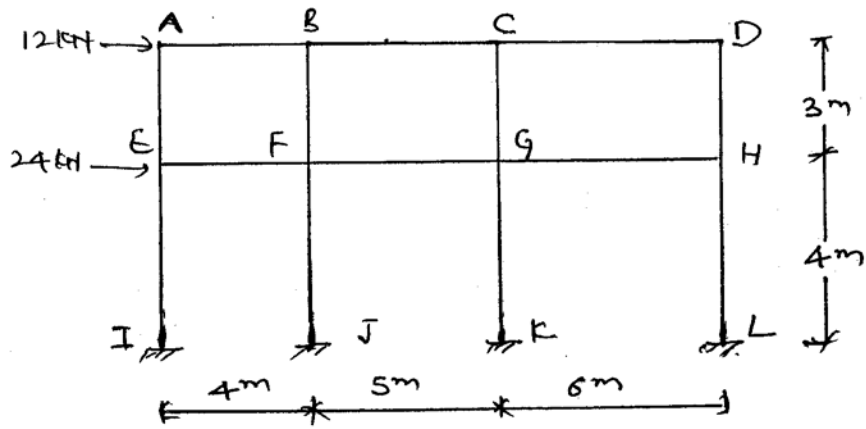
- a) State Maxwell reciprocal theorem.
- b) Differentiate between sway and non sway frames.
- c) Write slope deflection equation.
- d) Explain displacement factor.
- e) Explain substitute frame method.
- f) Write assumptions for cantilever method.
- g) What does influence line diagram represents? Explain.
- h) Explain reasons behind sway in frames.
- i) What will be the fixed end moments if a beam of length 5m, fixed at both ends is subjected to a point load of 5 kN at distance 2m from left support.
- j) Under what conditions the strain energy method is suitable to use?

SECTION B

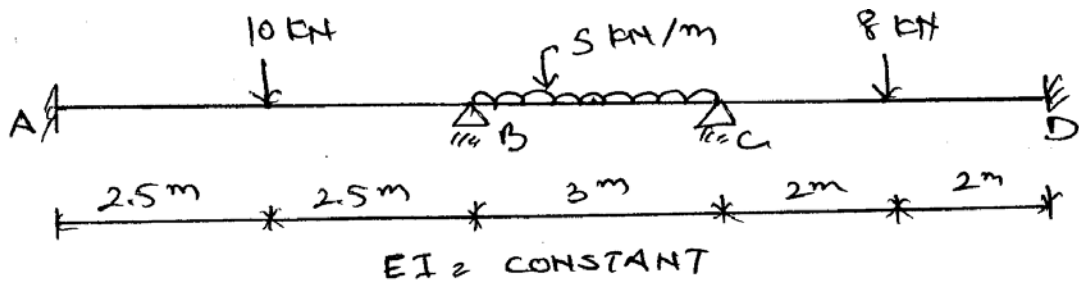
2. Differentiate between force and displacement method of analysis?
3. Analyse the beam ABCDE. If support C sinks by 8 mm. Given $E=200\text{kN/mm}^2$ and $I=0.8 \times 10^8 \text{ mm}^4$.



4. Analyse the frame shown in figure by cantilever method. Take cross sectional area of all columns as same.



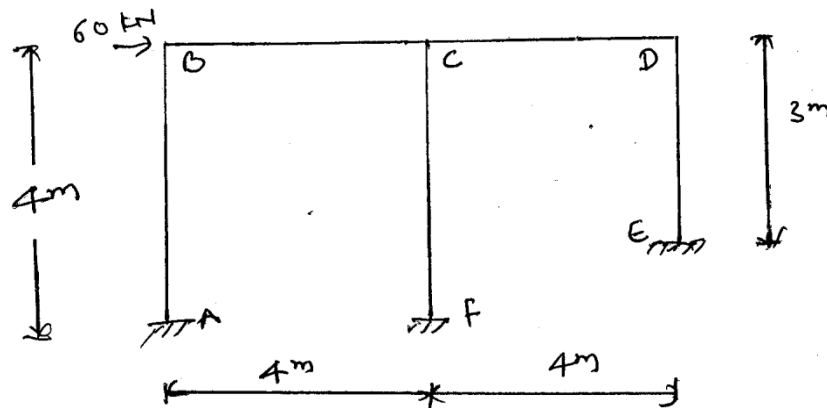
5. Determine reactions at support and draw B.M.D and S.F.D for the beam loaded and supported as shown in figure using three moment equation method.



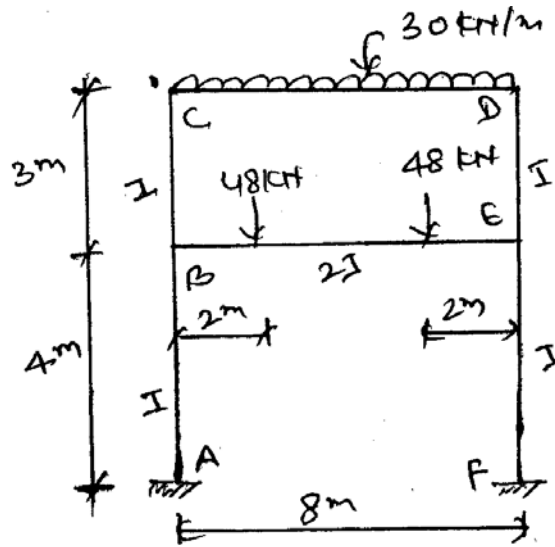
6. Derive the expression for distribution factor for a beam where 4 members are meeting at a joint.

SECTION C

7. Analyse the frame shown in figure by moment distribution method. Moment of inertia of all the members are the same.



8. Analyse the symmetric frame shown in figure given below



9. a) Derive the expression for stiffness of a beam.
 b) In case of a beam with the other end simply supported the stiffness is modified as $3EI/L$ and the carry over factor is taken as zero. Give the justification.