

[5353] - 104
T.E. (Civil Engineering)
STRUCTURAL ANALYSIS - II
(2012 Pattern)

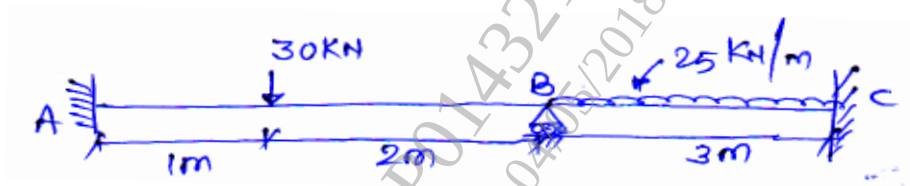
Time : 2½ Hours]

[Max. Marks : 70

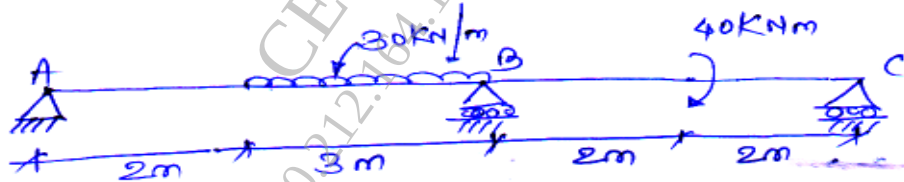
Instructions to candidate:

- 1) Attempt Q.1 or Q.2, Q.3. or Q.4, Q.5 or Q.6, Q.7 or Q.8.
- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary & indicate clearly.
- 4) Use of electronic non-programmable calculator is allowed.

- Q1) a)** Determine the support moments by using slope deflection method for the beam shown in figure. Take $EI = \text{Constant}$. **[10]**

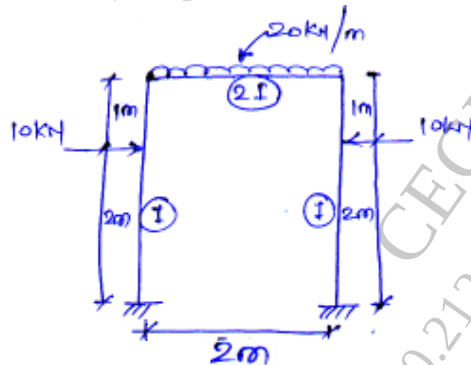


- b)** Analyse the beam shown in fig. by flexibility method. Take $EI = \text{constant}$. **[10]**



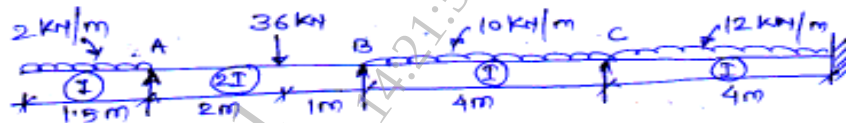
OR

- Q2) a)** Analyse the beam by slope deflection method. Draw SFD & BMD. **[10]**

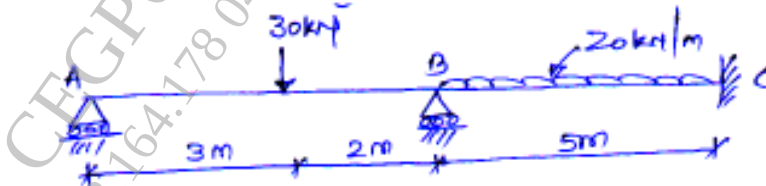


P.T.O.

- b) Determine moment at support of the continuous beam using moment distribution method. Draw BMD. [10]

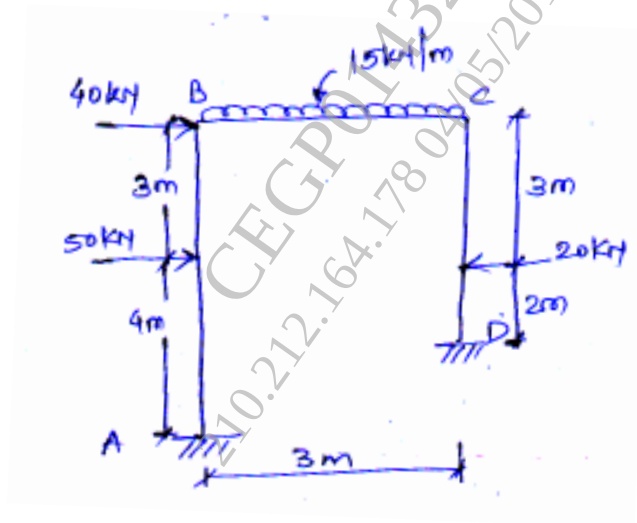


- Q3) Analyse the beam shown in fig. by stiffness method. Support 'B' sinks by 30mm. Take $EI = 380 \text{ kNm}^2$. [16]

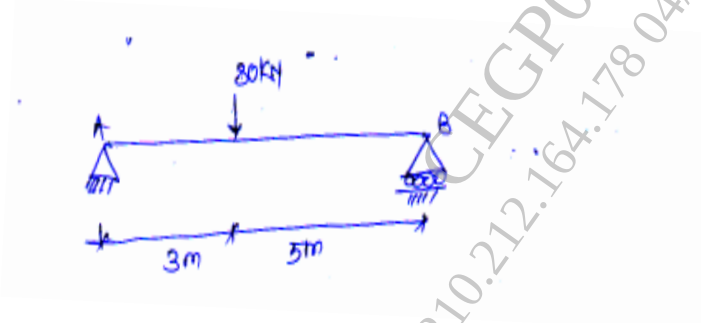


OR

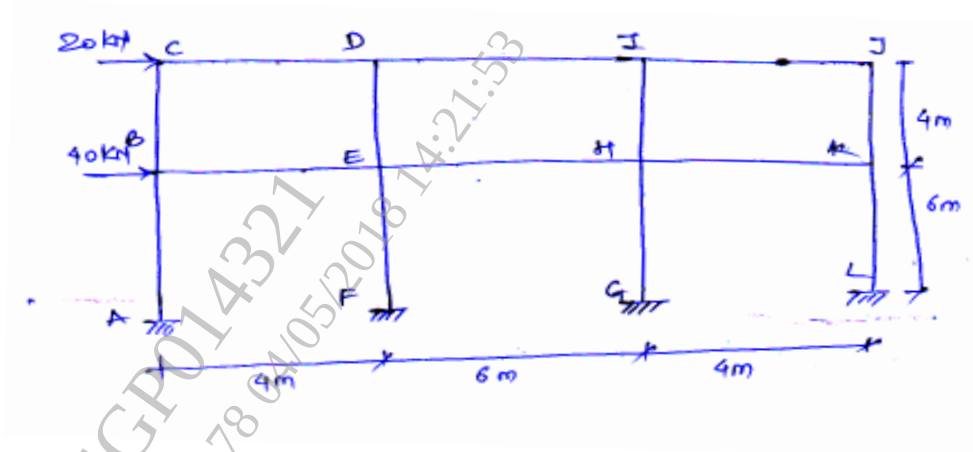
- Q4) Analyse the frame by stiffness matrix method. Take $EI = \text{const.}$ [16]



- Q5) a) The beam is supported & loaded as shown in fig. find deflⁿ under load. Take 5 nodes [8]

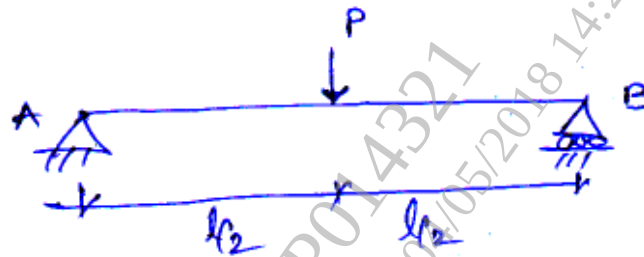


- b) Analyse the frame shown in fig. by cantilever method & draw BMD.[10]



OR

- Q6) a) The beam is supported & loaded as shown in fig. Determine deflection at centre. Use finite difference method. [8]



- b) Analyse portal frame of Q. 5 (B) by using portal method. Draw BMD.[10]

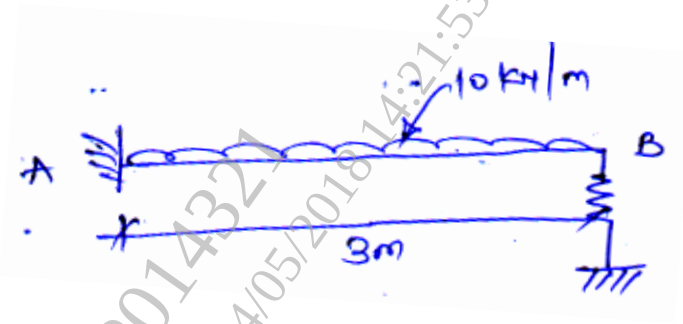
- Q7) a) Explain the terms [8]

- Axisymmetric element
- Shape function
- Quadrilateral element
- Quadratic stress - strain triangle

- b) Determine shape function for constant strain triangle. Use polynomial function. [8]

OR

- Q8) a)** Analyse the beam shown in figure. Take EI = constant stiffness of spring is $EI/2$ [8]



- b)** Explain terms [8]
- i) Nodes
 - ii) Constant strain triangle
 - iii) Linear strain triangle
 - iv) Higher order elements

