B.E. Civil Engineering (Model Curriculum) Semester - V
PCC-CE504 - Structural Analysis-I

P. Pages : 2

Time : Three Hours
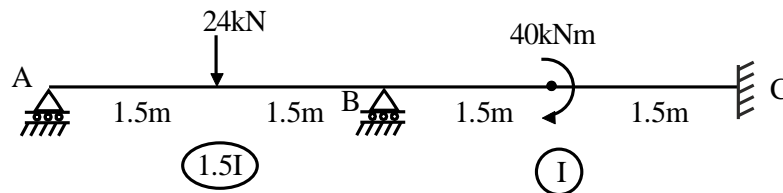
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* 2 4 6 3 *

Max. Marks : 80

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Notes : 1.   All questions carry equal marks.
2.   Due credit will be given to neatness and adequate dimensions.
3.   Assume suitable data wherever necessary.
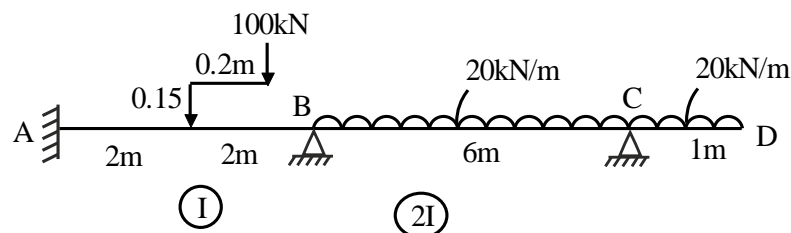4.   Illustrate your answers wherever necessary with the help of neat sketches.

1.   Find the moments and reactions at the supports. A continuous beam ABCD 15m long rests   **16**
on supports A, B, C and D. It carries two concentrated loads 90kN and 80kN at 2m and 8m
from A and udl of 30kN/m over CD. AB = 6m, BC = 5m and CD = 4m. Solve by three
moments theorem.

OR

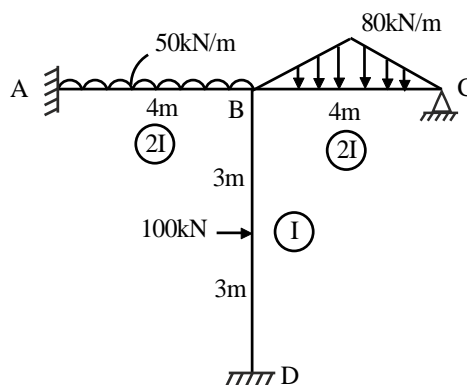2.   Analyse the beam shown in figure 1 using slope deflection method.   **16**

3.   Draw BMD and SFD for the beam as shown in figure. Use Moment distribution method   **16**
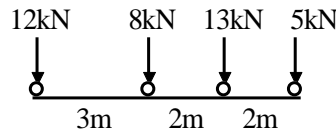for the analysis.

OR

4.   The rigid frame as shown in figure is subjected to loads. Analyse the frame using moment   **16**
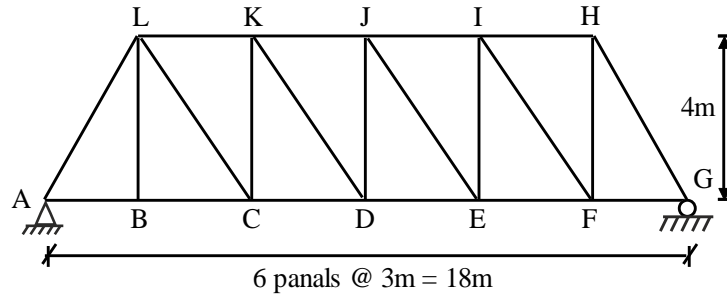distribution method and draw BMD.

5. Calculate the maximum BM at 8m from left support of 12m span simply supported beam **16**
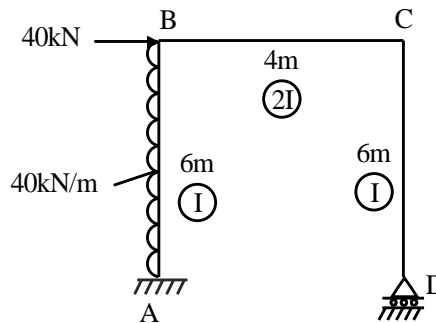when the given wheel load is moving from right to left

12kN   8kN   13kN   5kN

3m   2m   2m

OR

6. Draw ILD for the forces in the members of the truss shown in figure. Find forces in JI, JD **16**
and CD.

L   K   J   I   H

4m

A   B   C   D   E   F   G

6 panals @ 3m = 18m

7. Analyse the frame shown in figure by strain energy method draw BMD. **16**

B   C

40kN

4m

②I

6m   6m

40kN/m

I   I

A   D

OR

8. Two hinged portal frame ABCD of uniform flexural rigidity consists of column of 6m **16**
height and a beam 4m length. Using strain energy draw BMD.
Refer following figure.

40kN/m

B   C   50kN

4m

6m   6m

A   D

9. a) Determine the maximum value of slenderness ratio (λ) for which the Euler's theory is valid. **10**

b) For applying Euler's formula find the minimum value of the Slenderness ratio for mild **6**
steel strut with both ends fixed. Take the yield stress as 315MPa and E as 210GPa.

OR

10. A two hinged parabolic arch of span 40 m and rise 8m carries a point load of 80kN at a **16**
distance of 10m from the left support. Find the horizontal thrust at each support. Find also
the maximum bending moment.

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