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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FIFTH SEMESTER B.TECH DEGREE EXAMINATION(R&S), DECEMBER 2019
Course Code: CE303
Course Name: STRUCTURAL ANALYSIS -11

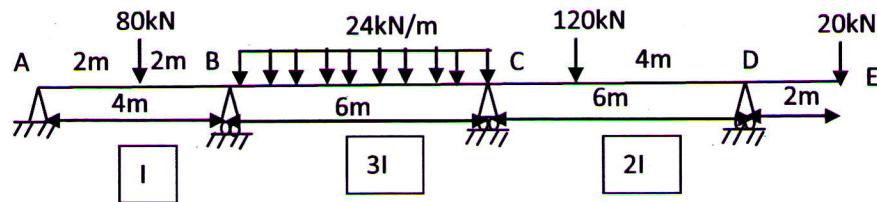Max. Marks: 100   Duration: 3 Hours

PART A
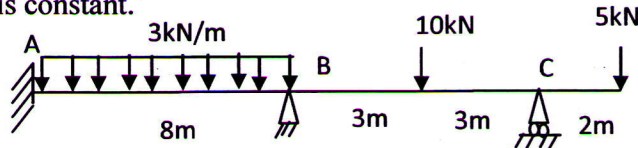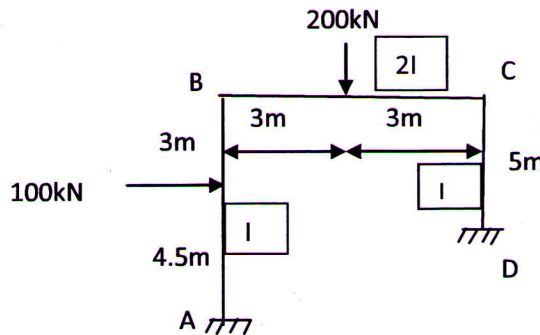### *Answer any two full questions, each carries 15 marks.*   Marks

1   Analyse the continuous beam shown in figure by three moment theorem. Relative   (15)
         I values are marked below each span. Draw BMD and SFD.

2 a)   What are the causes of sway in portal frames?   (3)

b)   Using slope deflection method, analyse the continuous beam and draw BMD and   (12)
         SFD. EI is constant.


3   Analyse the portal frame by slope deflection method and draw shear force   (15)
         diagram and bending moment diagram. Relative *I* values are marked for each
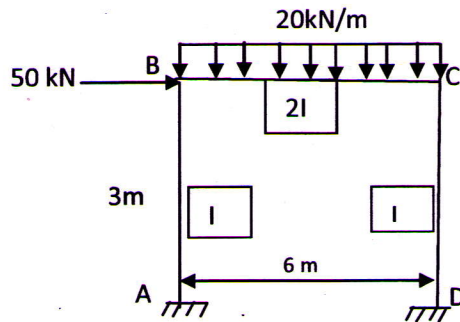   member.

PART B
Answer any two full questions, each carries 15 marks.

4   a)   Explain distribution factor and carryover factor   (3)

    b)   Using moment distribution method, determine the support moments in the   (12) continuous beam ABCD. Due to external loading, support B settles by 5mm and C by 10mm. Assume EI as 80,000kN-m^2.Relative *EI* values are marked below each span.
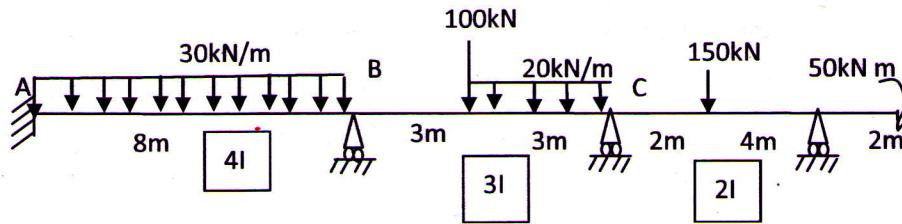
5   Analyse the portal frame by Kani's method and draw BMD.   (15)

6   a)   Distinguish between rotation factor and displacement factor   (3)

    b)   Using Kani's method, find out the end moments of the members of the portal   (12) frame. Relative EI values are indicted along the members.
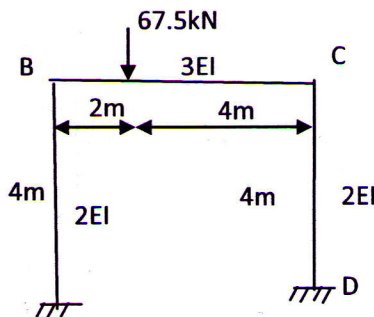
PART C

Answer any two full questions, each carries 20 marks.

7 a) A curved beam in the form of a quadrant of a circle of radius 3m and having a   (6)
uniform cross-section is in a horizontal plane. It is fixed at A and free at B and
carries a vertical concentrated load 30kN at the free end B. Draw shear force,
bending moment and twisting moment diagrams.

b) Find the bending moment at midspan of a semicircular beam uniformly loaded   (14)
over the whole beam by a vertical load of intensity 10kN/m and simply supported
at the ends and at midspan. Find also the bending moment and twisting moment at
quarter points in the beam. Radius of the beam = 5m.

8 a) Explain plastic section modulus   (2)

b) State the three theorems of plastic collapse   (5)

c) Determine the collapse load (W_c) for the fixed beam by kinematic method   (13)
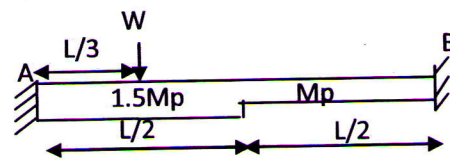
9 a) Determine the shape factor for a triangular section of base *b* and height *h*   (5)

b)   (15)

Find the value of Mp for the frame of uniform section under the applied factored
loads.

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