

B. Tech 5th Semester Examination

Structural Analysis-II (NS)

CE-311

Time : 3 Hours

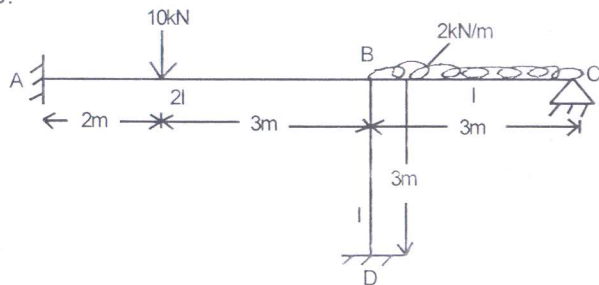
Max. Marks : 100

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

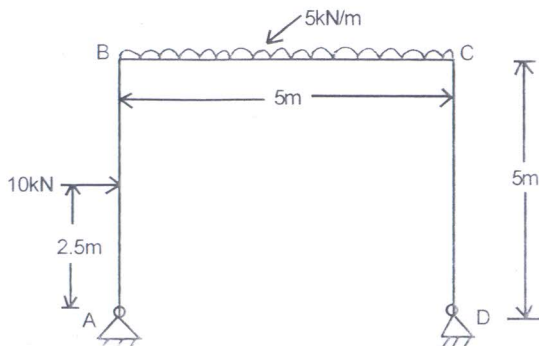
Note : Attempt one question from each section. Section E is compulsory and all questions carry equal marks.

SECTION - A

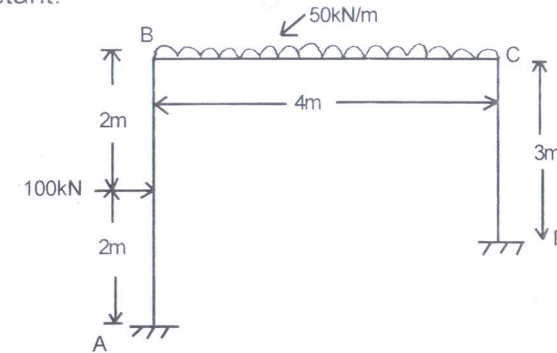
1. A continuous beam ABC is supported on the elastic column BD, and is loaded as shown in the figure below. Treating B as rigid, analyse the frame and plot the BMD. Also sketch the deflected shape of the structure. (20)



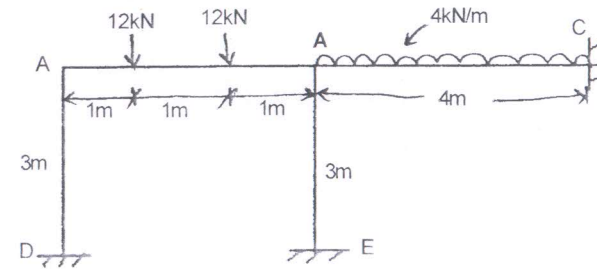
2. Using Unit load method, determine the reactions at support for the portal frame shown in figure below. (20)



3. Using Slope-deflection method, determine the moments at each joint for the frame shown in figure below and draw its moment diagram. EI is constant. (20)

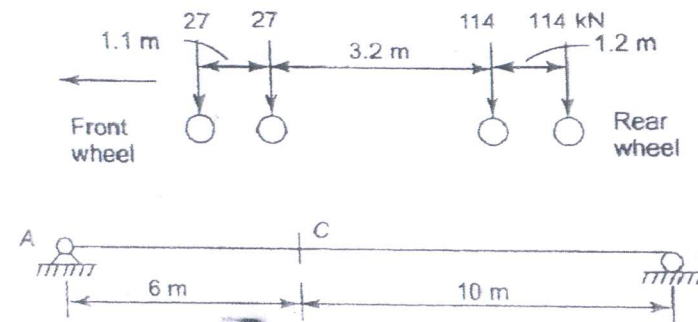


4. Using Moment distribution method, determine the moments at each joint for the frame shown in figure below and draw its bending moment diagram. EI is constant. (20)

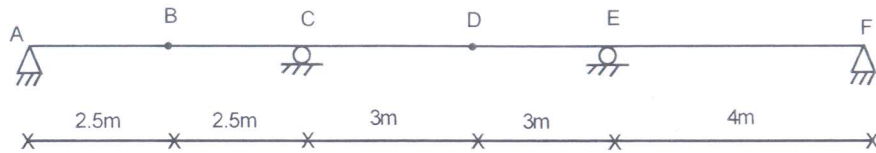


SECTION - C

5. Determine the maximum moment and shear force at C for the span shown in figure below due to the IRC Class A loading of driving vehicle moving in either direction. (20)

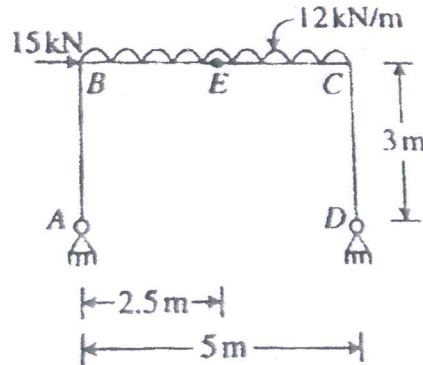


6. Using Muller-Breslau principle, draw the influence line diagram with its ordinates for the reactions at A & F, shear and moment at points B, D & E for the figure shown below (B and D are internal hinges). (20)



SECTION - D

7. A beam fixed at both ends is subjected to a UDL 'W' on the right half portion. Determine the value of collapse load W_c . The beam is of uniform plastic moment M_p . (20)
8. Using Kinematic method, determine the plastic moment of resistance for the frame shown below and draw its bending moment diagram. (20)



SECTION - E

9. (i) State Maxwell's Reciprocal theorem and Betti's law.
 (ii) Differentiate between static and kinematic indeterminacy.
 (iii) List the assumptions in slope deflection method and write its generalized equation.
 (iv) Distinguish between force and displacement method.

- (v) Explain distribution factor and Carryover factor.
 (vi) State and prove Muller Breslau's Principle.
 (vii) State Upper and Lower bound theorems.
 (viii) Define shape factor and mention its values for rectangular, circular and diamond sections.
 (ix) Define rotation factor and write its sum value at a joint.
 (x) Draw the influence line diagram for reaction at left support of a simply supported beam. (10×2=20)