C 1115 (Pages : 4) Name.....

Reg. No.....

SIXTH SEMESTER B.TECH. (ENGINEERING) [09 SCHEME] DEGREE EXAMINATION, APRIL 2016

CE/PTCE 09 603—STRUCTURAL ANALYSIS—III

Time : Three Hours Maximum : 70 Marks

Part A

Answer **all** *the questions.*
Each question carries 2 *marks.*

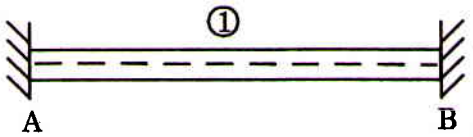
1. (a) Differentiate Force and Displacement methods.
   (b) What are the limitations of flexibility method ?
   (c) Define stiffness Coefficient.
   (d) What is the need of direct stiffness method ?
   (e) Define Critical damping coefficient.

(5 × 2 = 10 marks)

Part B

Answer any **four** *questions.*
Each question carries 5 *marks.*

2. (a) Compare Static indeterminacy and kinematic indeterminacy.
   (b) Compare slope deflection method and stiffness method.
   (c) What are the steps involved in Stiffness method for plane truss analysis ?
   (d) Derive the Beam stiffness matrix of the following prismatic beam.



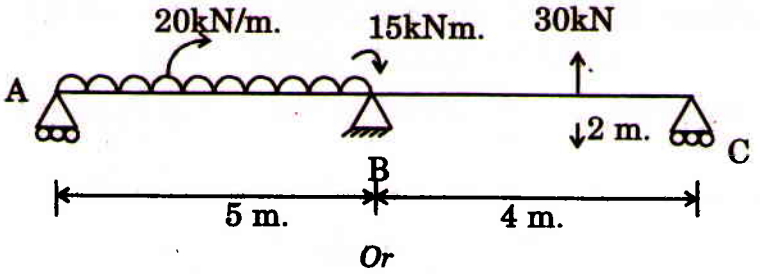
   (e) Write short notes on the following :
      (i) D'Alembert's principle.
      (ii) Logarithmic decrement.
   (f) Write short notes on Mass-Spring-Damper system for two degree of freedom.

(4 × 5 = 20 marks)

Turn over

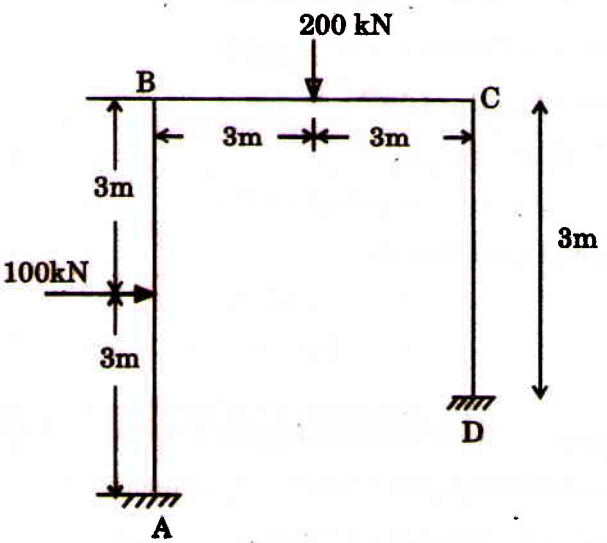
Part C

3. (a) Analyse the Continuous beam shown below by flexibility method and draw the BMD.

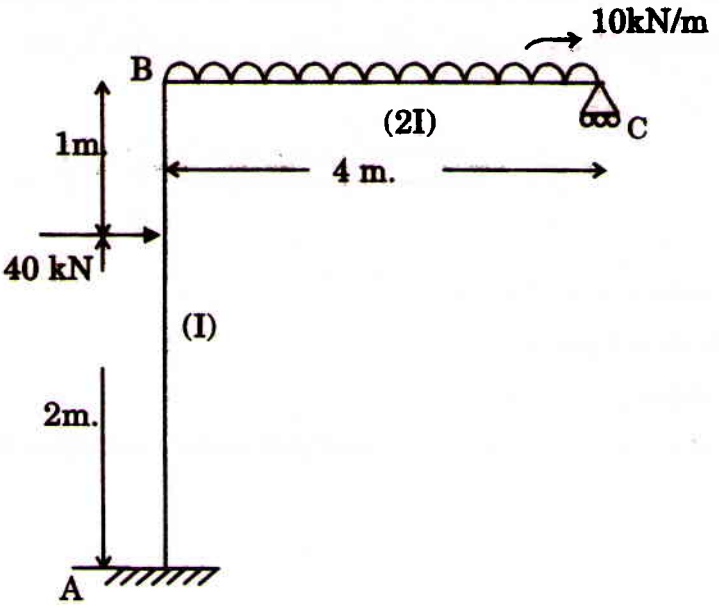


Or

(b) Analyse the frame shown below by flexibility method and draw the BMD.

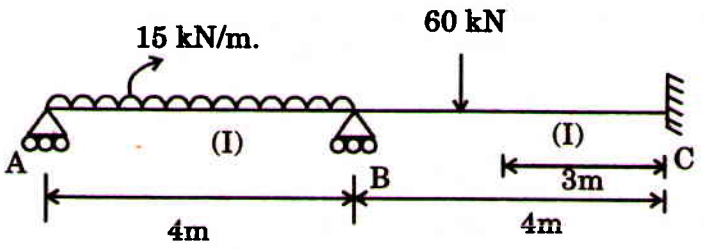


4. (a) Analyse the frame shown below by Stiffness method and draw BMD.

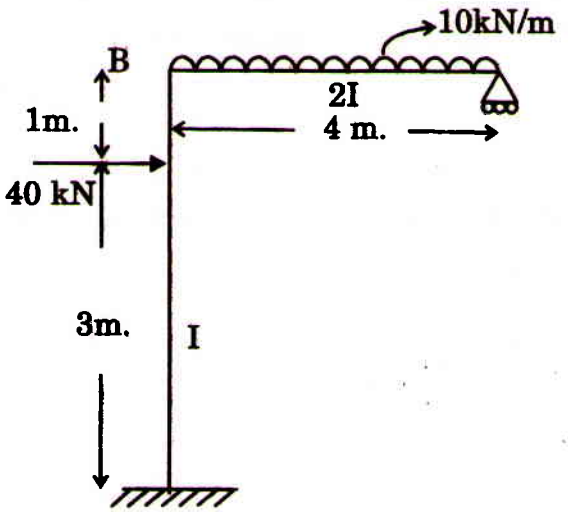


Or

(b) Analyse the Continuous beam shown below by Stiffness method and draw the BMD.

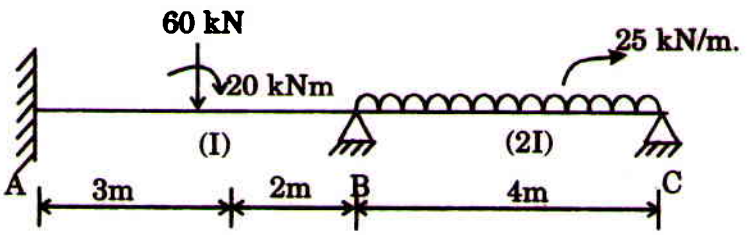


5. (a) Analyse the frame by Direct Stiffness method and determine the element forces.
$A = 3 \times 10^4$ mm^2, E = 16 Gpa, $I = 35 \times 10^7$ mm^4

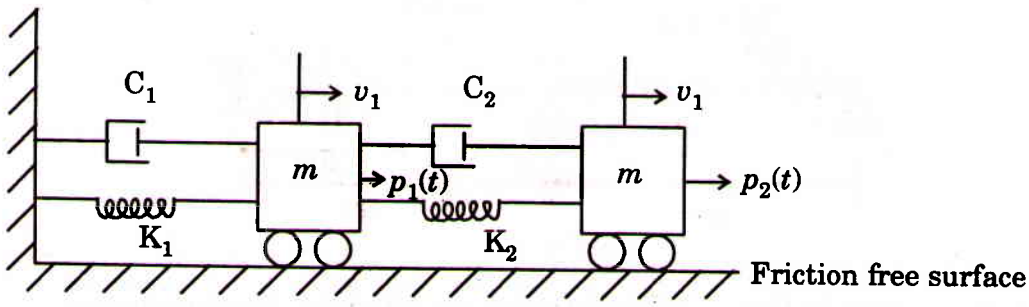


Or

(b) Analyse the Continuous beam by direct stiffness method and draw the BMD.

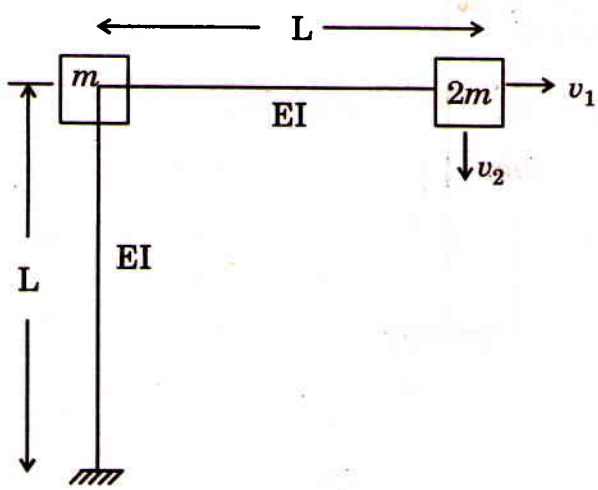


6. (a) Formulate the equation of motion for the following mass-spring system.



Or

(b) Formulate the free vibration equations for the two- element frame shown in below. For the both elements the flexural stiffness is EI, and axial deformations are to be neglected. The frame is massless with lumped masses at the two nodes as shown.



(4 × 10 = 40 marks)