

C 18227

(Pages : 3)

Name.....

Reg. No.....

**SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION
JUNE 2011**

CE 04 602—STRUCTURAL MECHANICS—III

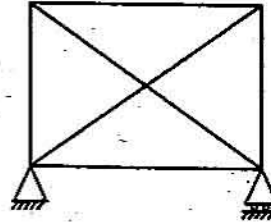
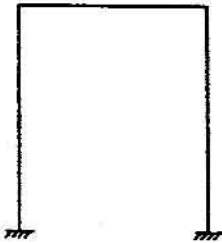
(2004 admissions)

Time : Three Hours

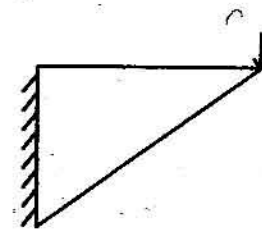
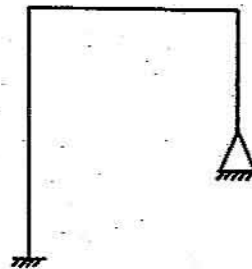
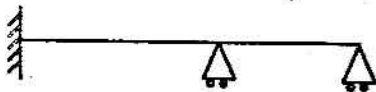
Maximum : 100 Marks

Answer all questions from question I and for remaining questions answer any one choice.

- I. 1 Explain load transformation matrix.
2 Find degree of indeterminacy for following structure.



- 3 Define degree of kinematic indeterminacy.
4 Determine DKI for structure shown below :

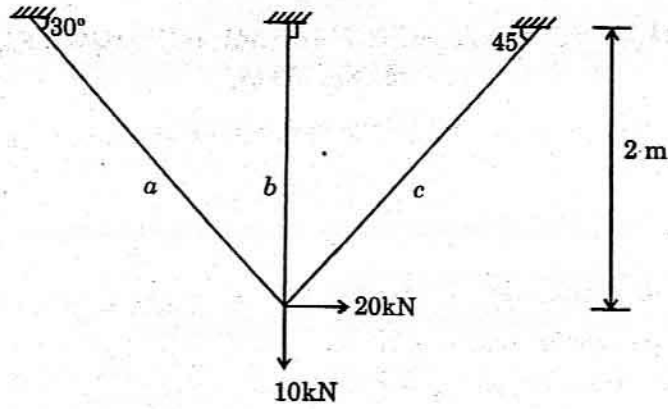


- 5 What is the relation between flexibility and stiffness matrix ?
6 Explain Direct stiffness method.
7 Explain logarithmic decrement.
8 Describe Damping in structures.

(8 × 5 = 40 marks)

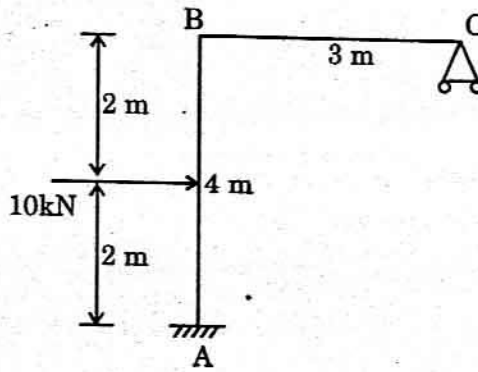
Turn over

II. (a) Analyse truss using flexibility method. AE is constant for all members.



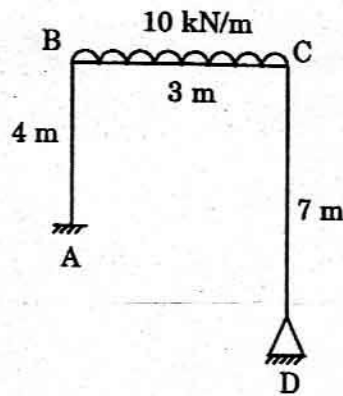
Or

(b) Analyse portal frame using flexibility method.



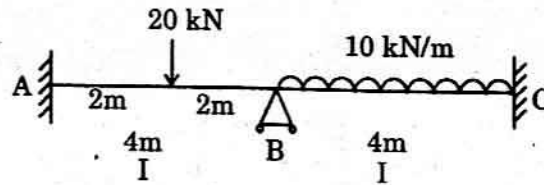
III. (a) Analyse portal frame using stiffness method. Draw BMD.

(20 marks)



Or

- (b) Analyse beam using direct stiffness method and draw BMD.



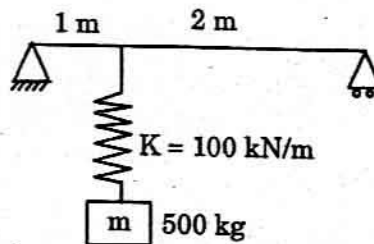
(20 marks)

- IV. (a) Calculate natural frequency of transverse vibrations of a cantilever beam 40 mm diameter circular cross-section, carrying a load of 500 N at the free end. Span of beam is 800 mm $E = 200 \text{ GPa}$.

If a spring of stiffness 85 kN/m is introduced between the load and beam, calculate change in the natural frequency.

Or

- (b) Calculate natural frequency of vibration of system given $I = 5 \text{ m}^4$ $EI = 60000 \text{ kNm}^2$.



(3 × 20 = 60 marks)