Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER–III • EXAMINATION – WINTER • 2014

Subject Code: X30603 **Date: 31-12-2014**

Subject Name: Structural Analysis-II

Time: 10:30 am - 01:00 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** Define ILD and Explain Muller Breslau's Principle. **04**

(b) Draw ILD for V_A , V_B and M_A for a propped cantilever beam of span 10 m subjected to a unit load. Take 1 m intervals. **10**

Q.2 **(a)** For a three hinge parabolic arch of span L, central rise H subjected to udl over entire span, derive that Bending moment at any location is zero. **07**

(b) A three hinged parabolic arch of span 16 m and central rise of 4 m is subjected to a point load of 50 kN at 6 m from left end support. Calculate Support reactions and find out maximum positive bending moment. **07**

OR

(b) Differentiate between stiffness and flexibility. **07**

Q.3 **(a)** Derive basic equation for slope deflection method. **04**

(b) Analyse the beam as shown in **Figure-1** below and draw BMD. Use Slope Deflection Method. **10**

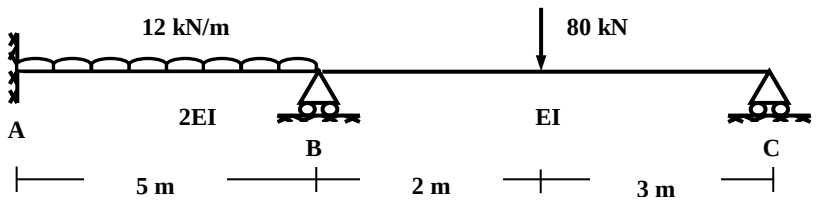

Fig. -1

OR

Q.3 Analyse the beam as shown in **Figure-1** using stiffness method and draw SFD and BMD. **14**

Q.4 **(a)** Calculate the load carrying capacity using Euler's and Rankine's Formula for a rectangular column having 230 mm x 300 mm in cross section and 5 m effective length. The ends of the column are fixed. Take E = 3.6 x 10^4 N/mm^2 , Rankine's Constant = 1/1600, fc = 250 N/mm^2. **07**

(b) Give characteristics of stiffness and flexibility matrix. **04**

(c) Define Carry over Factor, Distribution Factor, Carryover Moment **03**

OR

Q.4 Analyse the plane frame as shown in **Figure-2** below using flexibility method. **14**

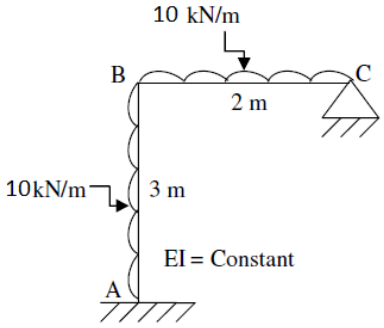

Fig. -2

Q.5 A propped cantilever beam of span 6 m is subjected to point load at center. Analyse the beam using flexibility method and draw shear force and bending moment diagrams. **14**

OR

Q.5 Analyse the beam as shown in **Figure-3** using Moment Distribution Method. **14**

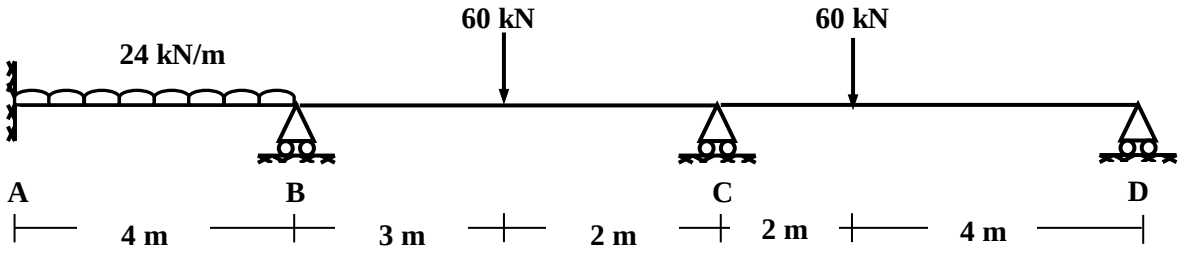

Fig. -3

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