Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV(OLD)• EXAMINATION – WINTER 2016

Subject Code:140603 **Date:23/11/2016**

Subject Name:Structural Analysis-2

Time:02:30 PM to 05:00 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)** Derive the equation of fixed end moment developed due to U.D.L. of intensity *w* applied on a fixed beam AB of length *l*. **07**

(b) State and explain Castigliano's theorem I & II. **07**

Q.2 **(a)** Analyze the fixed beam shown in fig.1 using moment area theorems. **07**

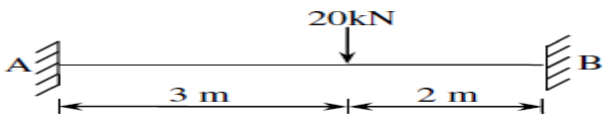

fig.1

(b) What is an influence line diagram? Explain its importance in structural analysis? **07**

OR

(b) Using consistent deformation method determines all reaction components of beam as shown in fig.2 and plot SFD and BMD. **07**

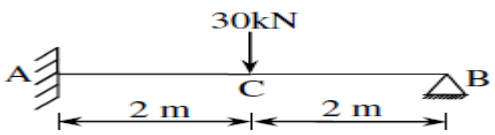

fig.2

Q.3 **(a)** Define & explain the following terms with neat sketch. **04**

(1) Stiffness (2) Relative stiffness

(b) Analyse the beam as shown in fig.3 using moment distribution method and draw bending moment diagram. **10**

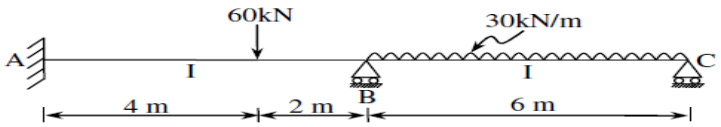

fig.3 (Q.3 (b), Q.4 (a), Q.5 (b))

OR

Q.3 **(a)** Analyse the portal frame as shown in fig. 4 using moment distribution method Draw the bending moment diagram and sketch the deflected shape of the frame. **14**

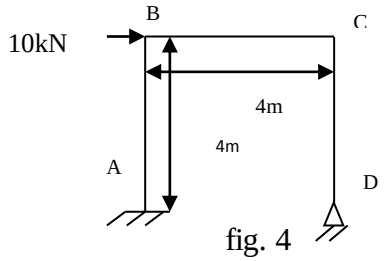

fig. 4 (Q.3 (a), Q.4 (a)) EI = Constant

Q.4 **(a)** Using slope deflection method analyzes the beam as shown in fig.3 . Draw Shear force and Bending Moment Diagram. **10**

(b) Enumerate slope deflection equations only, for two span continuous beam , portal frame without sway , portal frame with side sway and two span continuous beam with middle support sinks by ó. **04**

OR

Q.4 **(a)** Using slope deflection method analyzes the frame as shown in fig.4 . **10**

(b) Describe Load balancing concept in prestressed concrete beams. **04**

Q.5 **(a)** Draw influence line diagrams of reaction at A and B for a propped cantilever beam AB of span 5 m with ordinate interval of 1.0 m using muller Breslau principle. **07**

(b) Analyze the continuous beam as shown in fig.3 by Kani's Method and draw bending moment diagram only. **07**

OR

Q.5 **(a)** Explain: (i) Pretensioning and (ii) Post tensioning systems of prestressing. **07**

(b) Enlist steps for Analyze the indeterminate beams and frames Using Energy Principles. **07**

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