

GUJARAT TECHNOLOGICAL UNIVERSITY**B.E. Sem-IV Remedial Examination Nov/ Dec. 2010****Subject code: 140603****Subject Name: Structural Analysis-2****Date: 06 /12 /2010****Time: 03.00 pm – 05.30 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)** Find out fixed end moment and maximum deflection for a Fixed beam as shown in fig.1, carrying uniformly distributed load (u.d.l.) of w /unit run for span of L meter. **10**
- (b)** State and explain the MULLER BRESLAU principle **04**

- Q.2 (a)** Using the slope deflection method, compute the end moments and plot the bending moment diagram for the beam as shown in fig.2. The beam has constant EI for both the spans. **07**
- (b)** A beam AB of span 5 meter fixed at both ends carries a uniformly distributed load of 18 kN /m over the whole span. The right end 'B' sinks by 15 mm. Determine the fixed end moments and the reactions at the supports. Draw also shear force and bending moment diagrams. Take $E = 200 \text{ kN /mm}^2$ and $I = 7.5 \times 10^7 \text{ mm}^4$. **07**

OR

- (b)** Using the method of consistent deformation compute all reactions and draw shear force and bending moment diagram for the beam as shown in fig. 3. **07**
- Q.3 (a)** State and explain : Carry over factor, Distribution factor **04**
- (b)** Analyze the beam as shown in fig..4 by moment distribution method and draw shear force and bending moment diagram. The beam has constant EI for both the spans. . **10**

OR

- Q.3 (a)** Enlist advantages and disadvantages of fixed beam. **04**
- (b)** Analyze the frame as shown in fig.5 by moment distribution method and draw shear force and bending moment diagram **10**
- Q.4 (a)** Using the method of consistent deformation compute all reactions and draw shear force and bending moment diagram for the beam as shown in fig. 6. **07**
- (b)** Draw the influence lines for (i) reaction at B , (ii) and moment at A for the beam as shown in fig.7. Compute the ordinates at intervals of 2.0 meter. **07**

OR

- Q.4 (a)** State and explain Castiglione's theorems. **06**
- (b)** A continuous beam of two equal spans L is uniformly loaded over its entire length . Find the magnitude R of the middle reaction by using the Castiglione's theorem. **08**
- Q.5 (a)** Analyze the continuous beam ABCD shown in fig.8 by Kani's method. **10**
- (b)** Derive slope – deflection equation for a straight prismatic member carrying transverse loading. **04**

OR

- Q.5 (a)** A simply supported prestressed concrete beam 10 meter span, rectangular section 600 mm x 900 mm is subjected to prestressing force of 5600 kN at an eccentricity of 200 mm below the centroid of the section. Find top and bottom fiber stresses at transfer and after application of live load of 80 kN / m. Consider 15% losses. Draw stress distribution diagram at mid span. **08**
- (b)** Write short note on : **06**
- (i) Pre - tensioning , (ii) Post - tensioning

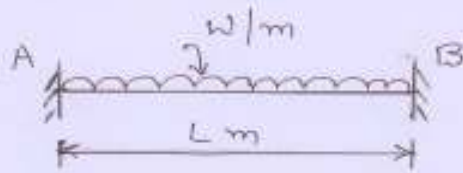


fig. 1 Q.1(a)

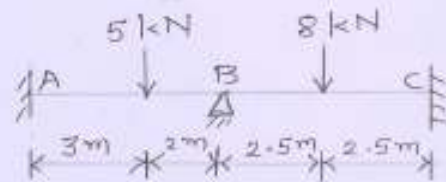


fig. 2 Q.2(a)

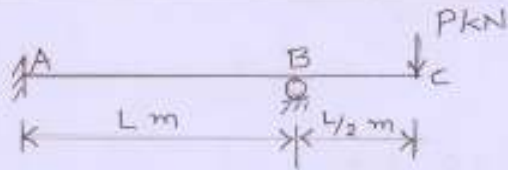


fig. 3, Q.2(b) OR

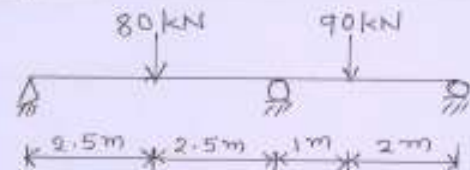


fig. 4 Q.3(b)

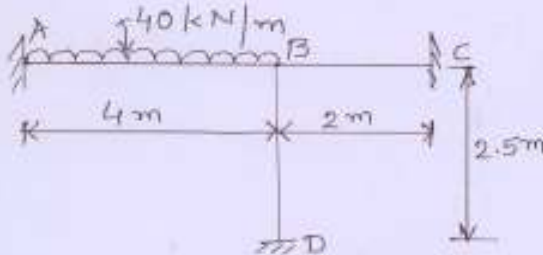


fig. 5, Q.3(b) OR

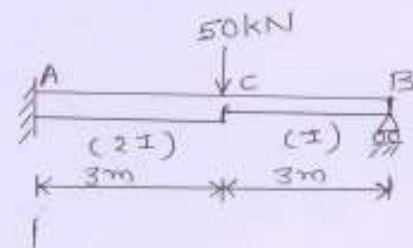


fig. 6 Q.4(a)



fig. 7 Q.4(b)



fig. 8 Q.5(a)

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