Student Exam No._____

GANPAT UNIVERSITY

B. Tech. Semester: 4th Civil Engineering

Regular (CBCS) Examination May/June 2013

2CI401 Structural Analysis - I

Time: 3 Hours | Total Marks: 70

Instruction: 1.All Questions are Compulsory
2. Figure to the Right indicates full marks.
3. Assume Suitable Data if necessary.

Section – I

Q-1 A simply supported beam has a span of 15 m. Uniformly distributed load of 40kN/m and 5 m long crosses the girder from left to right. Draw the influence line diagram for shear force and bending moment at a section 6 m from left end. Use these diagrams to calculate the maximum shear force and bending moment at this section. **12**

OR

Q-1 A simply supported beam with overhang on right side having span dimension of 10 m and 3 m respectively. Draw ILD for reaction at both support and shear and moment at 2.5 m and 7.5 m from left support of the beam. **12**

Q-2 **(A)** **Define Any Three Term** **03**

i. ILD
ii. Shear Centre
iii. Arch
iv. Indeterminate Structure

(B) Locate the shear centre O as shown in fig. 1 **09**

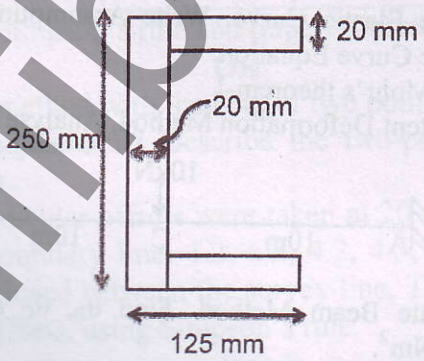


Figure 1

Q-3 **(A)** Show that the parabolic shape is a funicular shape for a three hinged arch subjected to a uniformly distributed load over to its entire span. **05**

(B) Draw ILD at R_A, R_B and Shear at C and Moment at C for simply supported beam of span 12 m. The C point is located 3 m from the left hand side of beam. **06**

OR

Q-3 **(A)** A three hinged symmetric parabolic arch of span 80 m and rise 16 m is subjected to a concentrated load of 60 kN and acting at 16 m from its left support and uniformly distributed load of intensity 20 kN/m acting over its entire right half portion. Draw the Bending Moment diagram. **05**

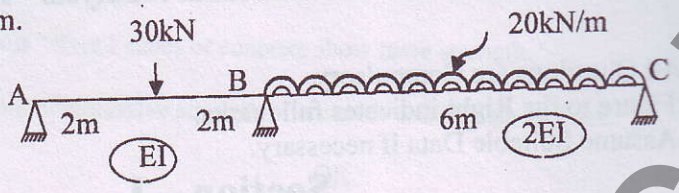
(B) Draw ILD at R_A, R_B and Shear at C and Moment at C for cantilever beam of span 10 m. The C point is located 3 m from the free end. **06**

P.T.O

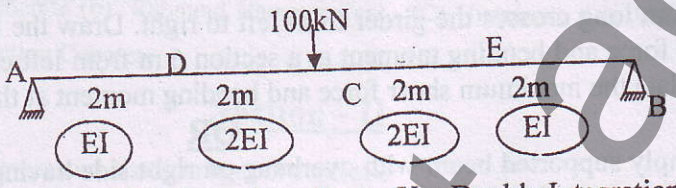
Section – II

Q-4 Attempt any two. 12

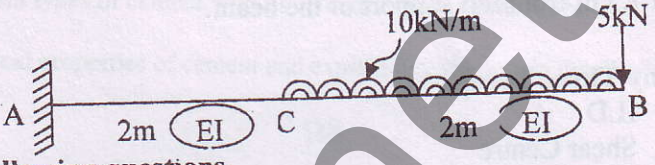
(A) Analyses Beam Shown below. Using Moment Distribution Method. Draw Bending Moment Diagram.



(B) Determine Central Deflection in Beam Shown below Use Moment Area Method.



(C) Find Deflection at Free End for a given Beam. Use Double Integration Method.



Q-5 (A) Attempt following questions. 08

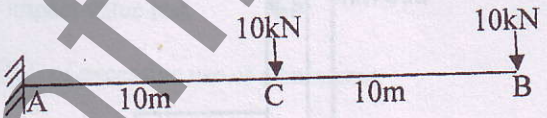
I. Write a difference between Actual Beam & Conjugate Beam.

II. What is indeterminate Structure? Enlist Methods used in Analysis of Indeterminate Structure.

III. Define Elastic Curve. Write Assumption used in Derivation of Differential Elastic Curve Equation.

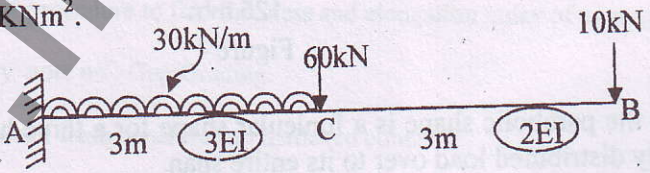
IV. State Mohr's theorem-I

(B) Using Consistent Deformation Method, Analyse Beam shown Below 03

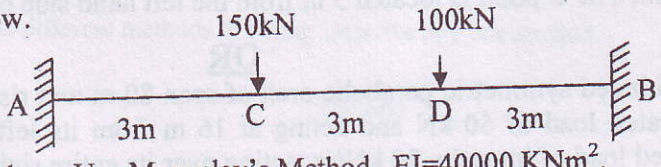


Q-6 Attempt any two. 12

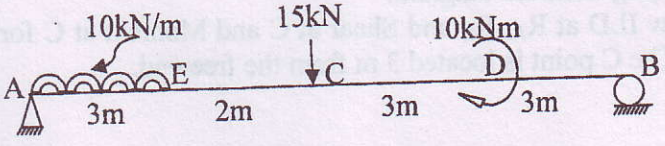
(A) Use Conjugate Beam Method. Find θ_B, θ_C and y_B, y_C for Beam shown below. EI=60000 KNm^2.



(B) Find Fixed End Moments & Reactions at Supports. Draw SFD and BMD for beam shown below.



(C) Find θ_D and y_C. Use Macaulay's Method. EI=40000 KNm^2.



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