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Total No. of Pages : 3

Seat No.	

T.E. (Civil) (Semester - VI) Examination, May - 2014

STRUCTURAL MECHANICS - III (New)

Sub. Code: 45542

Day and Date : Friday, 16-05-2014 **Total Marks : 100**

Time : 2.30 p.m. to 5.30 p.m.

Instructions : 1) **Attempt any three questions form Section - I and any three questions from Section - II.**

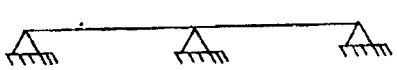
2) **Figures to the right indicate full marks.**

3) **Use of non-programmable calculator is allowed.**

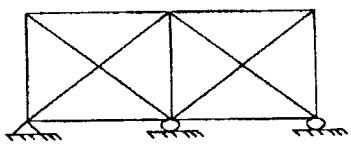
4) **Assume any suitable data, if required and state it clearly.**

SECTION - I

Q1) a) Find Static and Kinematic indeterminacies of the following structures. **[6]**



i)



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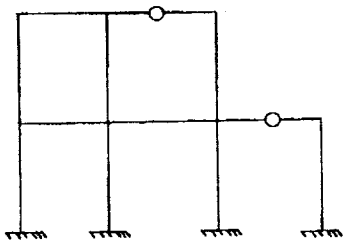

iii)

Fig. 1

b) A propped cantilever beam AB of span 5m is fixed at A and roller supported at B. It is subjected to a clockwise couple of 20 kNm at 2m from support A. Determine reaction at prop and draw SFD and BMD. **[10]**

P.T.O.

Q2) Analyze a fixed beam AB of span 6m, it carries UDL of 2kN/m over entire length of beam also a point load of 8kN and a clockwise moment of 10 kNm at 2m and 4m from support A respectively. Draw shear force and bending moment diagrams. **[16]**

Q3) A continuous beam ABCD is fixed at A and simply supported at B and C, such that AB = 3m, BC = 4m and overhang CD = 1m. It subjected to point load 6kN at 1m from A and 3kN at D. Span BC carries uniformly distributed load of 2kN/m. Analyse the beam using three moment theorem and draw SFD and BMD. Take $I_{AB} = 3I$, $I_{BC} = 4I$. **[17]**

Q4) a) Explain the stresses due to lack of fit. **[3]**

b) Find the forces in all the members of the truss loaded and supported as shown in figure. All members have same area of cross section. **[14]**

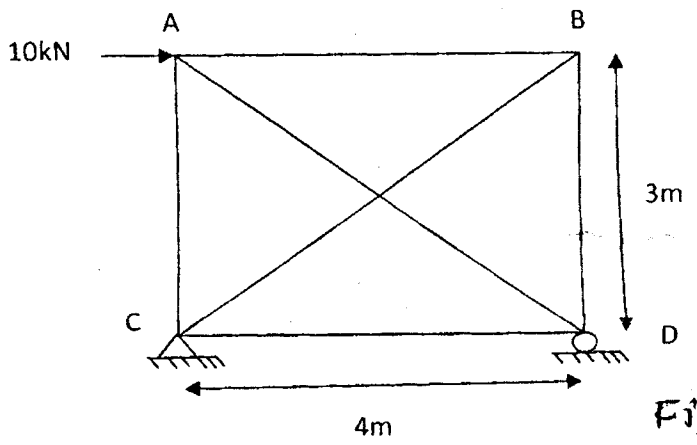

Fig 2

SECTION - II

Q5) Analyse the continuous beam ABCD shown in Fig. 3, if the support B sinks by 1 cm. Take I = 1600 cm^4 and E = 2×10^5 N/mm^2. Use slope deflection method. **[16]**

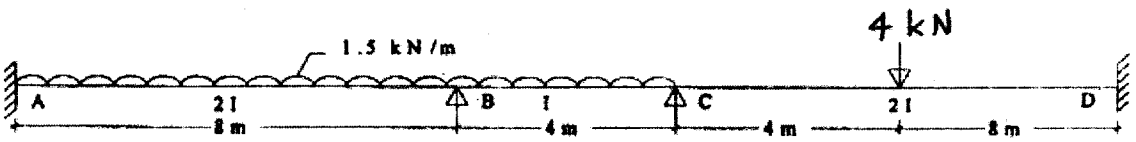

Fig. 3

Q6) a) Write note on distribution factor. [3]

b) Analyze the frame shown in Fig. 4 by moment distribution method. [13]

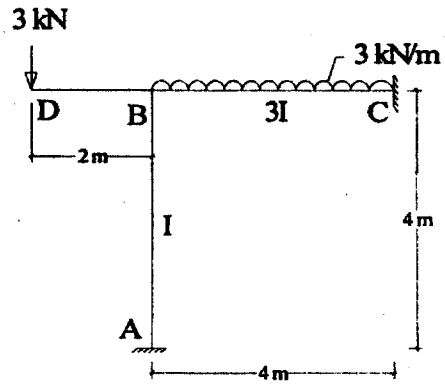

Fig. 4

Q7) Analyse the beam shown in Fig. 5 by flexibility method. The downward settlement of supports B and C are 2000/EI and 1000/EI respectively. Assume fixed moment at A and vertical reaction at B as a redundant. Hence draw S.F.D. and B.M.D. EI = constant. [17]

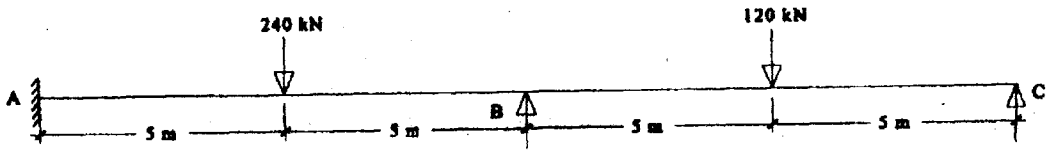

Fig. 5

Q8) Determine the moments at points O, A, B, C, D for the structure shown in Fig. 6 by stiffness method. [17]

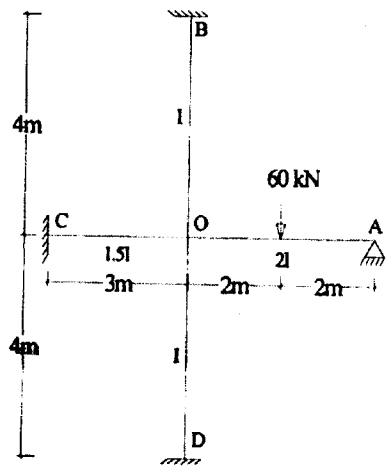

Fig. 6

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