S - 949

Seat No.	

Total No. of Pages : 3

T.E. (Civil)-II (Semester - VI) (Revised) (New) Examination, Dec. - 2013

STRUCTURAL MECHANICS - III

Sub. Code : 45542

Day and Date : Wednesday, 18 - 12 - 2013 **Total Marks : 100**

Time : 10.00 a.m. to 1.00 p.m.

Instructions :
1) **Attempt any three questions from each section.**
2) **Use of non-programmable scientific calculator is allowed.**
3) **Figures to the right indicate full marks.**
4) **Assume suitable data if necessary and mention clearly.**

SECTION - I

Q1) a) Write note on geometric instability. **[3]**

b) Find static (external and internal), kinematic (rotational and translational) and hence total indeterminacy of the structures shown in figure below. Comment on results. **[13]**

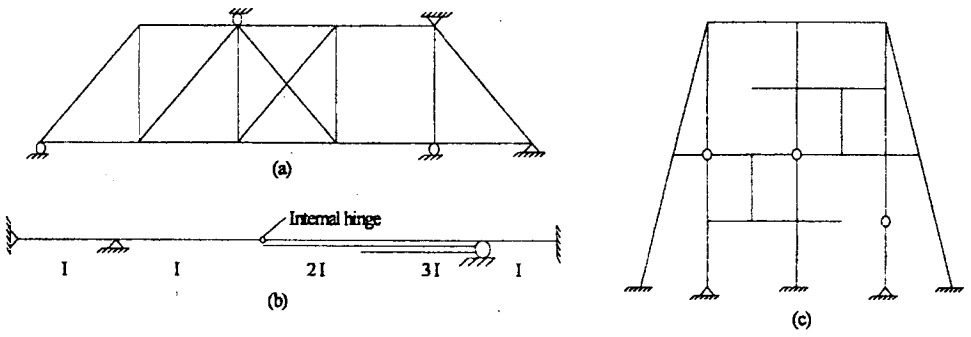


Figure (Q 1 b)

Q2) a) Write note on redundant reactions. **[3]**

b) A cantilever *ABC* of uniform section is fixed at *A* and propped at *B*. A point load of *W* is applied at free end *C*. Find the ratio of *AB* to *BC*, so that the reaction at *B* is 1.5 *W*. Also draw SFD and BMD. Use consistent deformation method. **[13]**

P.T.O.

Q3) A continuous beam *ABC* fixed at support *A* and simply supported at *B* and *C*. *AB* = 4 m and *BC* = 3 m. The beam carries an udl of intensity 50 kN/m over both spans. The support *B* sinks by 5 mm below *A* and *C* and the values of *EI* is constant throughout the beam. Analyse the beam by Clapeyron's theorem and hence draw SFD and BMD.

Take E = 200 GPa and I = 332 X 10^6 mm^4 **[17]**

Q4) A statically indeterminate frame shown in figure carries a load of 100 kN at A. Find the forces in all the members. The cross sectional area is same for all the members and all members are made up of same material. **[17]**

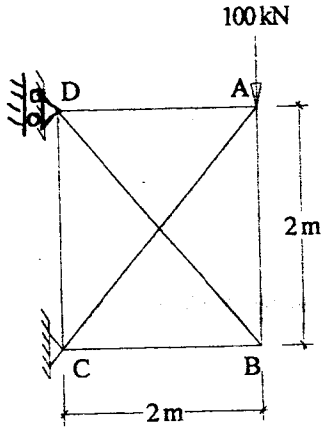
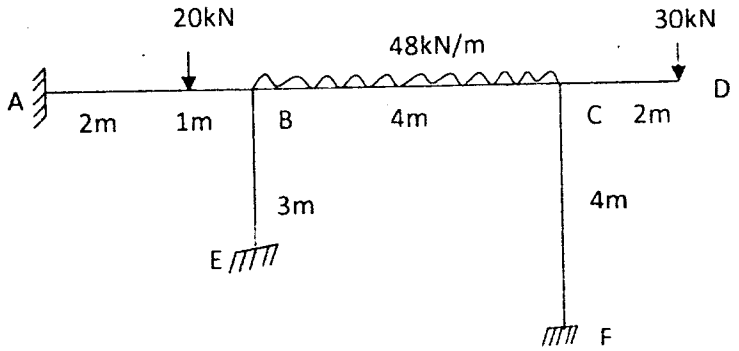


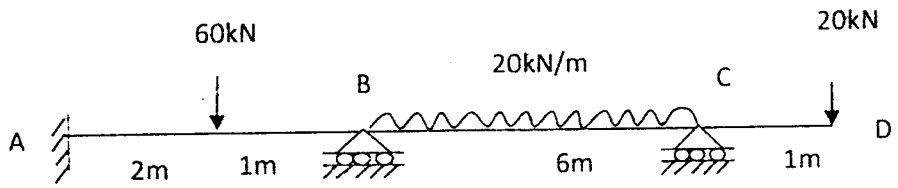
Figure (Q.4)

SECTION - II

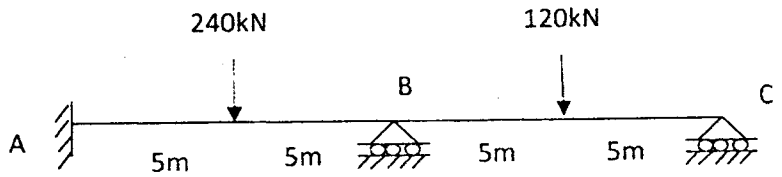
Q5) Analyse the frame loaded and supported as shown in figure by slope deflection method. Draw BMD. Take M.I for span AB=BE=I and BC=CF=2I. **[17]**



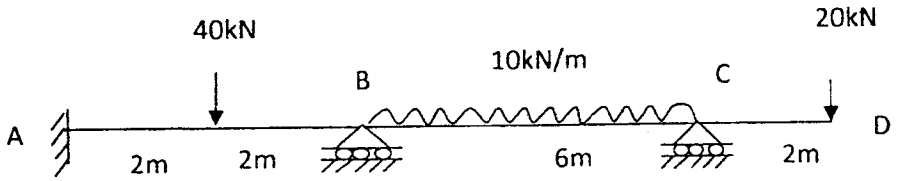
Q6) The continuous beam ABCD loaded and supported as shown in figure, analyse by moment distribution method, if support B sinks by 9 mm. Take $EI = 1 \times 10^{12}$ Nmm^2. Draw bending moment diagram. **[16]**



Q7) Analyse the beam loaded and supported as shown in figure, by using flexibility method. **[16]**



Q8) Analyse the beam loaded and supported as shown in figure, by using stiffness method. **[17]**



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