K-132

Seat No.	

Total No. of Pages : 3

T.E. (Civil) (Part-II) Examination, 2013
STRUCTURAL MECHANICS-III (Revised)
Sub. Code : 45542

Day and Date : Saturday 11 - 05 - 2013 **Total Marks : 100**

Time :2.30 p.m. to 5.30 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 degree of freedom. **[3]**

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

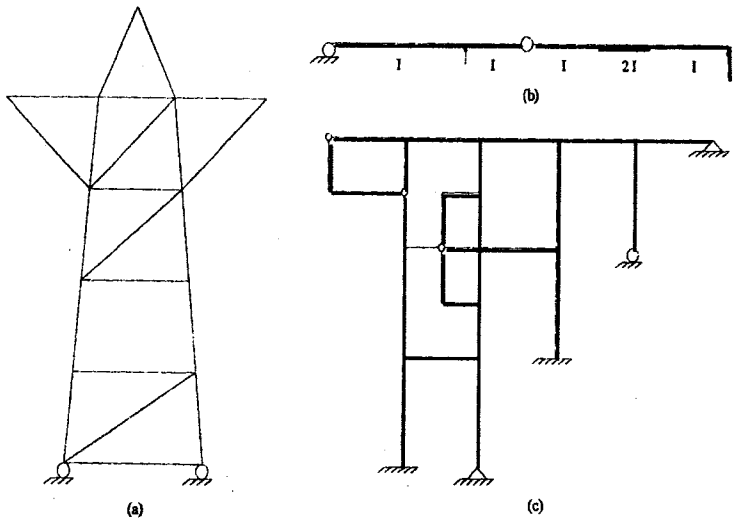


Figure (Q. 1 b)

Q2) a) Write note on geometric coherence. **[3]**

b) A timber beam 12 cm wide, 20 cm deep and 4 m long is loaded with uniformly distributed load. It is fixed at the left end and simply supported at the right end. If the maximum allowable fibre stress is 10 N/mm^2 and the right support settles by an amount equal to $wL^4/24$ EI, where w is

load per meter run, L is span and EI is flexural rigidity, determine the permissible value of load *w*. Hence draw SFD and BMD. Use consistent deformation method. **[13]**

Q3) a) What do you mean by zero span? **[3]**

b) Use the three moment equation to find the support moments for the beam shown below when support B settles by 0.5 cm down. Also draw SFD and BMD. Take E = 2000 kN/cm², I = 40,000 cm⁴. **[14]**

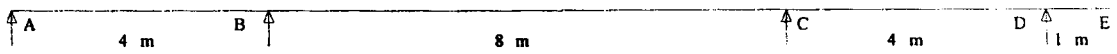


Figure (Q. 3 b)

Q4) Find the forces in all members of the truss shown in figure below. The value of AE is constant for all members. **[17]**

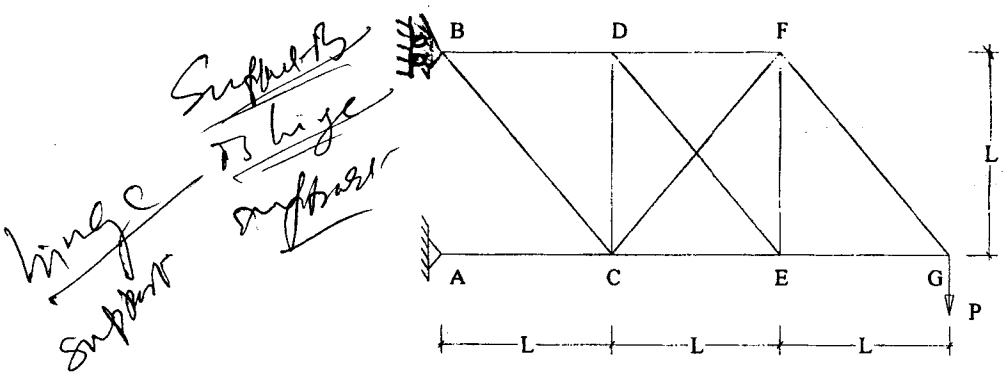
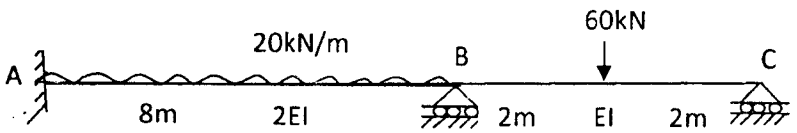


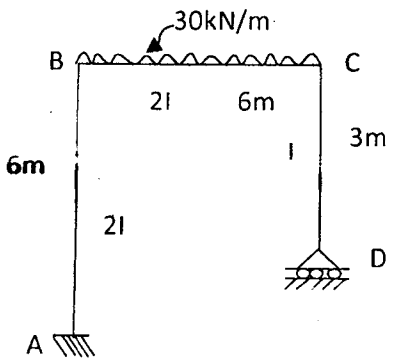
Figure (Q. 4)

SECTION-II

Q5) Analyse the continuous beam ABC as shown in figure, by slope deflection method, if support B sinks by 10 mm. Given EI = 4000 kNm². Draw BMD. **[16]**

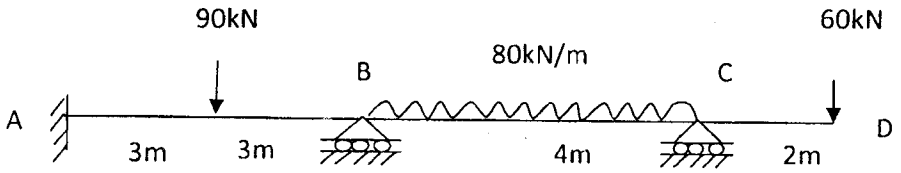


Q6) Analyse the frame shown in the figure by moment distribution method. Draw BMD. **[17]**



Q7) A continuous beam ABC is fixed at A and simply supported at B and C, such that AB = 4 m, BC = 3 m. It subjected to point load 100 kN at midspan of BC and span AB carries uniformly distributed load of 60 kN/m. Analyse the beam using flexibility matrix method. Draw BMD. **[16]**

Q8) Analyse the beam ABCD loaded and supported as shown in figure by stiffness method. Take $I_{AB} = 2I$, $I_{BC} = I_{CD} = I$. **[17]**



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