

B.E. (CE) Part-II 4th Semester Examination, 2007

Structural Analysis (CE-401)

Time : 3 hours

Full Marks : 70

Use separate answerscript for each half.

Answer SIX questions, taking THREE from each half.

The questions are of equal value.

Two marks are reserved for neatness in each half.

FIRST HALF

1. Figure Q1 shows the plan of a space truss. The ends B, C and D are simply supported in same horizontal plane. A load of 100kN is acting vertically downward at A. Find the forces in all members. The co-ordinates of joints are shown in bracket.

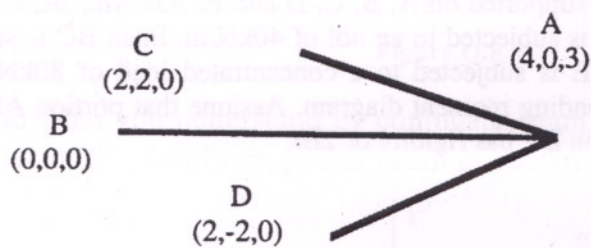


Figure Q1

2. A plane truss is shown in figure Q2. Find the vertical deflection at joint where the load of 30kN is acting. Assume modulus of elasticity as 200GPa and cross section area as 300mm² for all members.

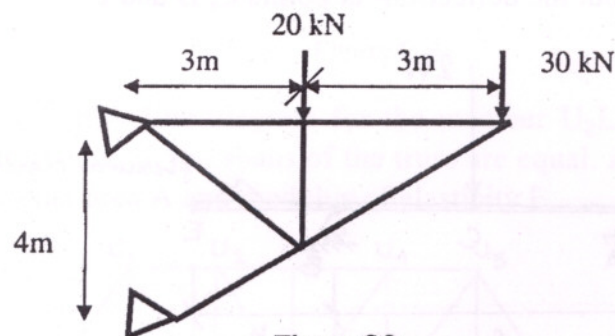


Figure Q2

3. Find the deflection at free end of the beam string system as shown in figure Q3. Assume modulus elasticity for both beam and string as 7×10^4 Mpa. The cross section area of string is 625 mm² where as cross section area of beam is 6250 mm². The moment of inertia for the beam is 66.8×10^6 mm⁴.

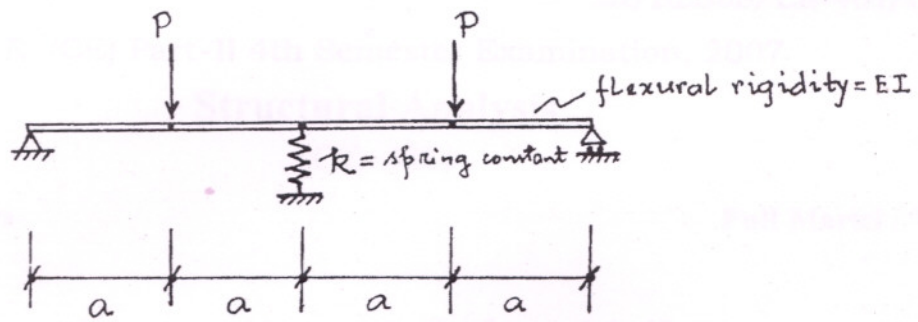


Figure.Q.7

8. Explain Muller-Breslan's Principle in connection with influence line diagram. Draw the influence diagrams for bending moment and shear force at point B of the simply supported beam as shown in Figure.Q.8.

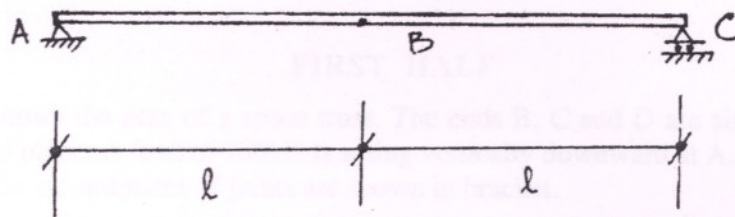


Figure.Q.8

9. Explain what you understand by conjugate beam. Find out the deflection at the middle point of the simply supported beam as shown in Figure.Q.9.

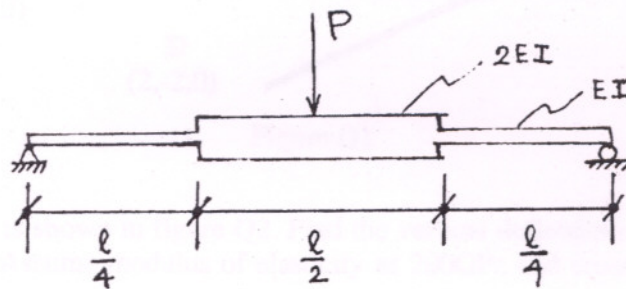


Figure.Q.9

10. Draw the influence line diagram for the member U_2L_3 of the truss shown in Figure.Q.10. Consider all the spans of the truss are equal. All members of the truss have cross sectional area A and modulus of elasticity E .

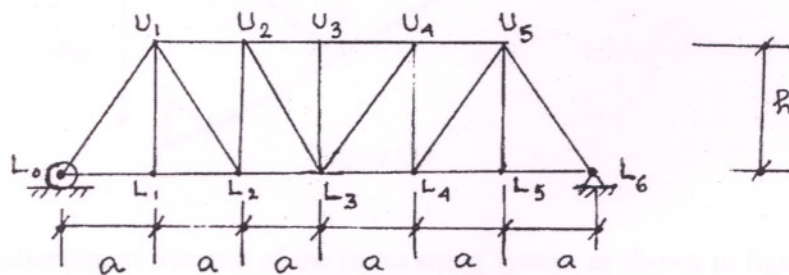


Figure.Q.10

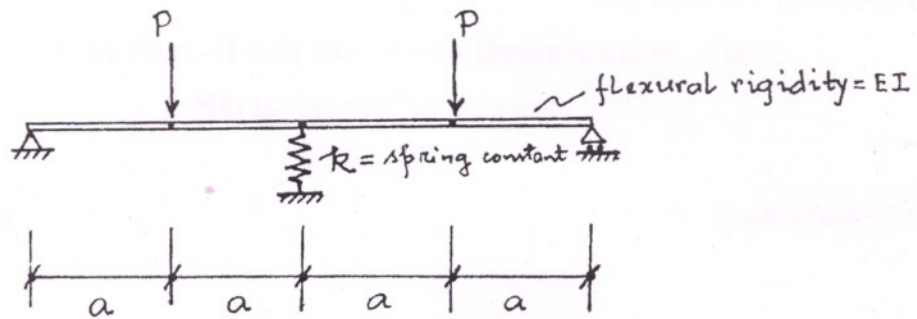


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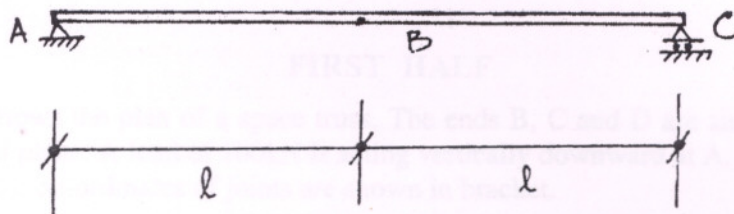


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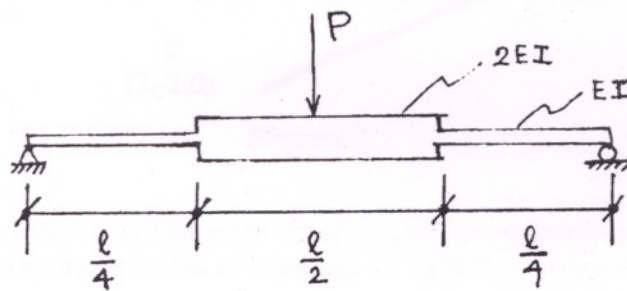


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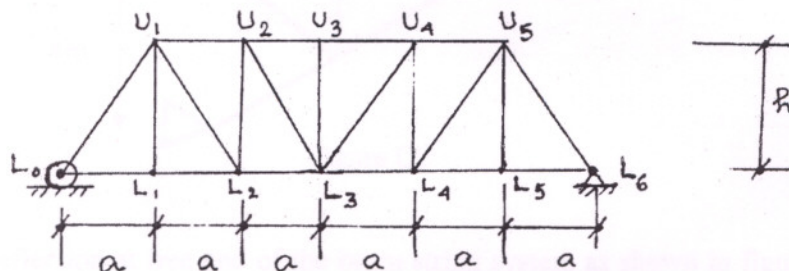


Figure.Q.10