

Code No: **R31015****R10****Set No. 1**

III B.Tech I Semester Supplementary Examinations, November - 2015
STRUCTURAL ANALYSIS – II
(Civil Engineering)

Time: 3 hours**Max. Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks

- 1 a) What do you understand by the term horizontal thrust? Derive an equation for the same. [7M]
b) A three hinged parabolic arch of 30meter span and 6 m central rise carries a point load of 6kN at 8m horizontally from the left hand hinge. Calculate the normal thrust and shear force at the section under the load. [8M]
- 2 a) What are the straining actions in a two-hinged arch? [3M]
b) A two-hinged parabolic arch of 30m span and 5m central rise has a varying second moment of area, which is proportional to the secant of the slope of its neutral axis. It carries a point load of 150kN at a distance of 10m from the left end. Determine the horizontal thrust, ending moment, normal thrust and shear force under the load. [12M]
- 3 a) Distinguish between portal and cantilever methods. [6M]
b) Analysis the building frame subjected to horizontal force as shown in figure-1 below. use portal method. [9M]

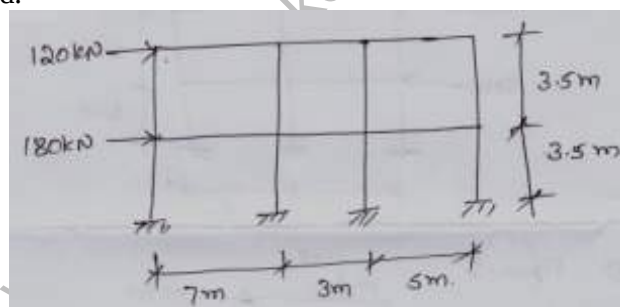


Fig.1

- 4 a) Derive an expression for the length of a cable. [6M]
b) A cable of uniform thickness hangs between two points 120m apart, with one end 3m above the other. The cable is loaded with a uniformly distributed load of 10kN/m and the sag of the cable, measured from the higher end is 5m. Find the horizontal thrust and maximum tension in the cable. [9M]
- 5 a) What do you understand by the term “distribution factor”? Discuss its importance in the method of moment distribution. [6M]

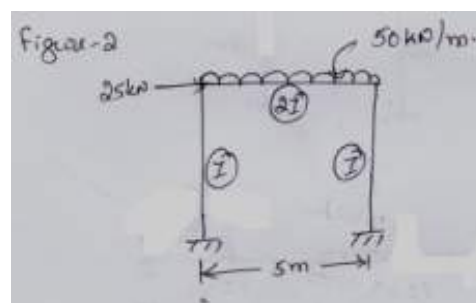
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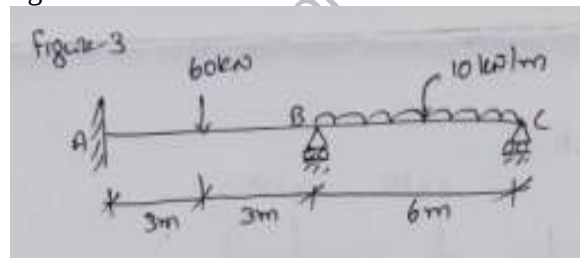
- b) A continuous beam ABCD is fixed at A and simply supported at B and C, the beam CD is overhanging. The spans AB=6m, BC=5m and overhanging CD=2.5m. The moment of inertia of the span BC is $2I$ and that of AB and CD is I . The beam is carrying a UDL 2kN/m over the span AB, a point load of 5kN in BC at a distance of 3m from B and a point load of 8kN at the free end. Determine the fixing moments at A, B and C and draw the bending moment diagram. [9M]

- 6 a) Analyze the frame as shown in figure-2 below by kani's method. [9M]



- b) Define the term "rotation factor". Discuss its importance. [6M]

- 7 a) Briefly mention the two types of matrix methods of analysis of indeterminate structures [6M]
b) Analyze the Continuous beam shown in figure-3 using flexibility method and draw bending moment diagram. [9M]



- 8 a) What is the basic aim of the stiffness method? [5M]
b) Analyze the continuous beam shown in figure-4 by stiffness method. Draw bending moment diagram. [10M]

