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Code No: **R31015**

III B.Tech I Semester Supplementary Examinations, May - 2016 STRUCTURAL ANALYSIS - II

R10

(Civil Engineering)

Time: 3 hours

Answer any FIVE Questions All Questions carry equal marks

- *****
- 1 Define the terms normal thrust and radial shear force, as applied in three-hinged arches. a) [5M]
 - A 3 hinged arch has a span of 30m and a rise of 10m. The arch carries a uniformly [10M] b) distributed load of 60kN/m on the left of its span. It also carries 2 concentrated loads of 160kN &100kN at 5m and 10m from the right end. Determine the horizontal thrust at each support.
- 2 a) Obtain an expression for the horizontal thrust, caused by the rise of temperature of a [6M] two-hinged arch.
 - A two-hinged parabolic arch of span 30m and rise 5m carries a point load of 150kN at a b) [9M] distance 10m from the left hinge. Determine the normal thrust and radial shear. Take I=I₀secθ.
- 3 What are the assumptions in cantilever method? a)
 - Analysis the building frame subjected to horizontal force as shown in figure-1 use b) [10M] cantilever method.

- 4 What are stiffening girders? Discuss their uses and types. a)
 - A suspension cable of 30m span and 3m dip is stiffened by a three-hinged girder. The [9M] b) dead load is 10kN/m. Determine the maximum tension in the Cable and maximum bending moment in the girder dip to concentrated load of 100kN crossing the girder, assuming that the whole dead load is carried by the cable without stressing the girder.

1 of 2

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Set No. 1

Max. Marks: 75

[5M]

[6M]

R10

Set No. 1

[8M]

Code No: R31015

- 5 a) Define the term "carry over factor". Derive a relation for the stiffness factor for a beam [8M] simply supported at its both ends.
 - b) A continuous beam ABC is fixed at A and is simply supported at Band C. The span AB [7M] is 6m and carries a UDL of 1kN/m. The span BC is 4m and carries a UDL of 3kN/m. Determine the fixed end moments.
- 6 a) Write down the step wise procedure for kani's method. [7M]
 - b) Analyze the frame shown in **figure-2** by kani's method.



- 7 a) Is it possible to develop the flexibility matrix for an unstable structure? Discuss. [6M]
 - b) Analyze the continuous beam shown in **figure-3** by the flexibility method and draw the [9M] bending moment diagram.



- 8 a) How are the basic equations of stiffness matrix obtained? [5M]
 - b) Analyze the continuous beam shown in **figure-4** by the stiffness method and draw the [10M] bending moment diagram.





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