CE-504 **Roll No.** | | | | | | | | | | |

B.Tech.
STRUCTURAL ANALYSIS - 2
(SEMESTER- V) EXAMINATION, 2015-16

Time: 3 Hours **Total Marks: 100**

Note: (i) Attempt ALL questions.
(ii) Marks are indicated against each question.
(iii) Assume any data suitably, if required.
(iv) Ensure desired numerical accuracy in your answers**.**

1. Attempt any **Two** parts of the following **10x2=20**

(a) Analyse the continuous beam shown in **figure1.**a by slope deflection method and draw bending moment and shear force diagrams.

(b) Analyse the given building frame in **Figure-1b** by Moment distribution method and draw bending moment diagram for entire frame.

(c) Analyse the continuous beam shown in **figure-1c** by Moment Distribution method and draw the bending moment & shear force diagrams.

2. Attempt any **TWO** parts of the following **10x2=20**

(a) A suspension cable of span 150m and a central dip of 10m carries a udl of 12KN/m of horizontal span over the full span. Find the vertical and horizontal forces transmitted to the supporting towers, if

a. Cable is passed over smooth pulley b. cable is clamped to the saddle with rollers on top of piers.

The anchor cable makes 45 degrees to the horizontal.

(b) A suspension cable of span 50m and a central dip 5m carries audl of 50KN/m over the entire span. Find the following

a. Maximum tension in cable b. Minimum tension in cable

c. The length of the cable.

(c) A three hinged stiffening girder of a suspension bridge of span 150m is subjected to two point loads of 250KN and 140 KN at a distance of 50m and 100m from the left end. Find the shear force and the bending moment in the girder at a section 60m from left end support. The central dip of the supporting cable is 15m. Find also the maximum tension in the cable.

3. Attempt any **TWO** parts of the following **10x2=20**

(a) A two hinged parabolic arch of span 35m is subjected to an udl of 5KN/m on entire span**.**The rise of the arch is 8m at crown.Calculate the Horizontal and vertical thrust at supports and bending moment at the loaded point 8m from the left support. Assume secant variation of the moment of inertia in the arch rib.

(b) A two hinged parabolic arch hinged at the ends has a span of 60m and rise of 12m at crown.A concentrated load of 10KN is acting at 15m from left hinge. Calculate the horizontal thrust and vertical reaction at hinge points. Also calculate the maximum bending moment at anywhere in the arch.

(c) Determine the influence line for reaction at support A for the continuous beam shown in **figure-3c.** Compute the ordinate at every 2m intervals.

4. Attempt any **TWO** parts of the following **10x2=20**

(a) What do you understand by Matrix methods for Analysis of Structures? Explain the different methods of analysis using matrix method with their relative advantages.

(b) Define the Stiffness matrix and Flexibility matrix and with suitable example establish the relationship between the two matrices.

(c) Develop the stiffness matrix of the beam shown in**Figure-4c**

5. Attempt any **TWO** parts of the following **10x2=20**

(a) Discuss how the plastic theory of structures works for an indeterminate structures and explain the following terms

a. Plastic hinge b. Plastic moment capacity. c. Shape factor.

(b) Determine the shape factor of a eye-section shown in **figure-5b.**

(c) Discuss the various types of failure Mechanisms in the plastic analysis. What are the different theorems used in Plastic analysis?