Enrollment No: _____ Exam Seat No:_____

C.U.SHAH UNIVERSITY

Winter Examination-2018

Subject Name : Structural Analysis - III
Subject Code : 4TE05STA1 Branch: B.Tech (Civil)
Semester : 5 Date : 30/11/2018 Time : 10:30 To 01:30 Marks : 70

Instructions:
(1) Use of Programmable calculator & any other electronic instrument is prohibited.
(2) Instructions written on main answer book are strictly to be obeyed.
(3) Draw neat diagrams and figures (if necessary) at right places.
(4) Assume suitable data if needed.

Q-1 **Attempt the following questions** **(14)**

a) A cantilever of span 'l' carries a load 'W' at the free end. Determine the flexibility of beam. (1)
b) What is the relation between the flexibility matrix and stiffness matrix? (1)
c) Why stiffness method is also called displacement method or equilibrium method? (1)
d) What do you mean by global or system stiffness matrix ? (1)
e) Sketch the influence line diagram for the bending moment at mid span section of a propped cantilever beam. (1)
f) Why do you preferred approximate method for the analysis of building frams? (1)
g) Draw the qualitative line diagrams for the reaction of a fixed beam. (1)
h) Sketch the influence line diagram for bending moment at a section X of a fixed beam. (1)
i) Give any two use beams curved in plan. (1)
j) What is shape factor for triangular section? (1)
k) What is hoop compression? (1)
l) Enlist any two losses in pre stress concrete (1)
m) What is crown? (1)
n) What is tendon? (1)

Attempt any four from Q-2 To Q-8:

Q-2 **Attempt all questions** **(14)**

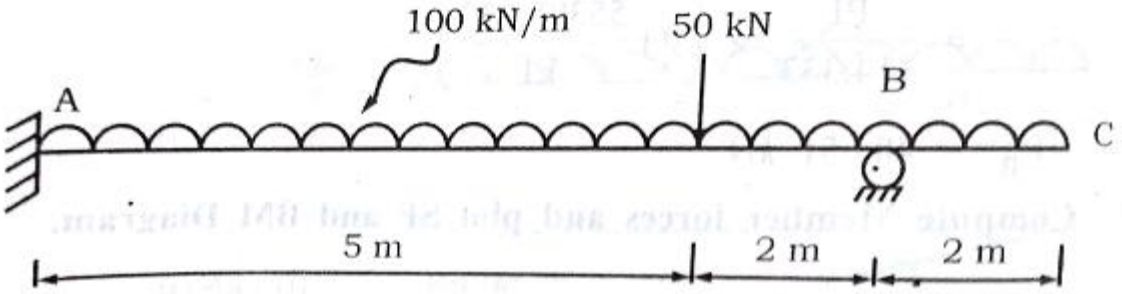
(a) A spherical dome of 100 mm thickness base diameter of 14m and central rise of 3.5 m is subjected to a lantern load of 5 kN at the crown. Determine the meriditional thrust and hoop stress at ring beam level. Assume density of concrete is 25 kN/m^2 **(7)**

(b) Analyse the spherical dome subjected to point load at the vertex. **(7)**

Q-3 **Attempt all questions** **(14)**

(a) Develop a stiffness matrix for a beam. **(7)**

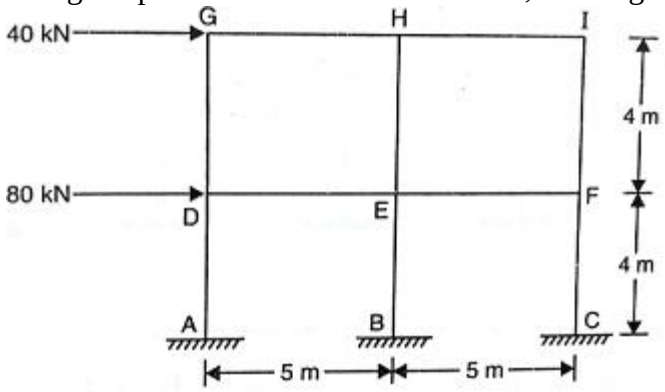
(b) Analysis the following beam by flexibility matrix method. Support 'B' sinks by 20 mm, Cross section of beam is 300 mm x 600 mm and E= 1 x 10^4 N/mm^2 . Draw SF and BM diagram **(7)**



Q-4 **Attempt all questions**

(a) Write difference between stiffness matrix methods and flexibility matrix method. **(4)**

(b) Using the portal method find shear force, bending moment axial force **(10)**



Q-5 **Attempt all questions** **(14)**

(a) A circular beam curved in plan symmetrical supported on six columns with radious of 5m. Determine the variation of shear force bending moment and torsional moment when it is subjected to uniformly distributed load of 5 kN/m throughout. **(10)**

(b) Write difference between straight beam and curved beam. **(4)**

Q-6 **Attempt all questions** **(14)**

(a) Analysis of conical dome subjected to uniformly distributed load. **(6)**

(b) A conical dome of 100 mm thickness and 3.5 m rise is to be used to cover a hall of 20 m diameter. The live load of 2.0 kN/^{m2} is acting over the dome surface. Calculate meriditional stress and hoop stress at the base of dome. Density of concrete is 25 kN/m3. **(8)**

(14)

Q-7 **Attempt all questions**

(a) A propped cantilever beam is having 10 m span. Draw I.L diagram for S.F and B.M at section 4 m from the fixed end. **(7)**

(b) Draw qualitative ILD for two span continuous and three span continuous beam. **(7)**

Q-8 **Attempt all questions** **(14)**

(a) Explain system of prestressing in detail **(7)**

(b) A rectangular beam 300 mm wide 200mm deep is prestressed by means of 15 wires each 5mm diameter wires located 65mm from the bottom of beam and three 5mm wires located 25mm from the top of the beam. If the wire are initially tensioned to a stress of 840 N/mm^2 calculate the percentage loss of stress in steel immediately after transfer allowing for the loss of stress due to **(7)**

elastic deformation of concrete only.E_s=210 kN/mm^2 E_c=35 kN/mm^2