Enrollment No: _____ Exam Seat No:_____

C.U. SHAH UNIVERSITY

Summer Examination-2019

Subject Name: Structural Analysis - III

Subject Code: 4TE05STA1 Branch: B.Tech (Civil)

Semester: 5 Date: 16/03/2019 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) What is meant by force method in structural analysis? (1)
b) A cantilever of span 'l' carries a load 'W' at the free end. Determine the flexibility of the beam. (1)
c) Define dome. (1)
d) What are the other name of the stiffness method? (1)
e) What are the assumption made in plastic theory? (1)
f) What are the condition to be condition to be satisfied for the plastic method of analysis? (1)
g) Draw the qualitative influence line diagram for the reactions of a fixed beam. (1)
h) Sketch the influence line diagram for shear force at a section x on a fixed beam. (1)
i) What is pre tensioning? (1)
j) State any two methods of matrix inversion. (1)
k) Write any two advantage of Prestressed. (1)
l) What are the properties of a structure stiffness matrix? (1)
m) Enlist various type of dome. (1)
n) State muller – Breslau Principal. (1)

Attempt any four questions from Q-2 to Q-8

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

(A) Enlist various method of Prestressing. Explain any one in detail. **(7)**
(B) A spherical dome with a span of 15 m and central rise of 3 m has all-inclusive load of 10kN/m2. Calculate all stresses at the mid height. **(7)**

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

(A) A quarter circular cantilever beam in plan is subjected to uniformly distributed load w/unit run throughout length. Draw shear force, bending moment and torsional moment diagram. **(7)**
(B) Analysis of curved beam in plan with fixed support. **(7)**

Q-4 **Attempt all questions** **(14)**

(A) Enlist various losses of Prestress. Explain any two in detail. **(7)**

(B) Calculate Mp required for a fixed beam span 8m and loaded by a collapse UDL 20 kN/m over left half 4m and a collapse concentrated load of 50kN at 6m from left span. **(7)**

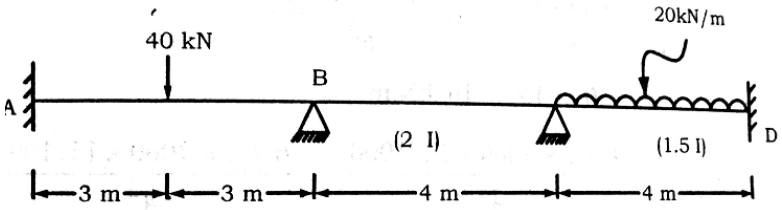
Q-5 **Attempt all questions** **(14)**

(A) Write short note on **(7)**
1) Meriditional Thrust
2) Hoop Compression

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

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

(A) For a continuous beam, show in fig support B sinks by 14mm and support C sinks by 10 mm. analyze the beam by stiffness matrix method.(EI=8000 KN.m^2). **(7)**



(B) A simply supported prestressed concrete beam 8m span. Rectangular section 500x800 mm is subjected to prestressing force of 5000kN at an eccentricity of 200 mm below the centroid of section. find top and bottom fiber stresses at transfer and after application of live load 60kN/m. consider losses 15% .draw stresses distribution diagram at mid span. **(7)**

Q-7 **Attempt all questions** **(14)**

(A) Write difference between stiffness and flexibility. **(7)**

(B) A quarter circular cantilever beams in plan is subjected to point load w at end. Draw shear force bending moment and torsion moment diagram **(7)**

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

Analyze the RC frame shown in fig by approximate method (portal method) of analysis Draw SF and BM diagram