**Enrollment No: _____ Exam Seat No:_____**

# C.U.SHAH UNIVERSITY

## Summer Examination-2018

**Subject Name : Structural Analysis - III**

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

**Semester : 5** **Date :23/03/2018** **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.

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

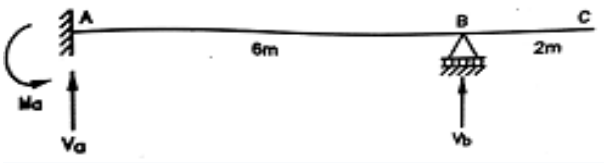
**a)** What is Static indeterminacy? (1)
**b)** Write any three characteristic of flexibility matrix. (1)
**c)** What is hoop force? (1)
**d)** Force required to produce unit ……is called stiffness (1)
**e)** Write equation of Meriditional stress. (1)
**f)** The portal method is also known as the ……..... (1)
**g)** Write MULLER-BRESLAN principle (1)
**h)** Enlist various type of dome. (1)
**i)** What is pre tensioning? (1)
**j)** Define plastic hinge. (1)
**k)** What is shape factors for triangular? (1)
**l)** What is the torsionl rigidity of circular section? (1)
**m)** What is collapse load? (1)
**n)** The shape of the cross- section which has the largest shape factor is…….(rectangular, I section, diamond, solid circular) (1)

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

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

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

**(B)** Draw influence line diagram for $V_a$, $V_b$, and $M_a$ for a beam shown below **7**



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

**(A)** Explain the concept of plastic analysis and discuss the assumptions in the plastic analysis. **(7)**

**(B)** Explain importance of ILD. **(7)**

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

**(A)** A quarter circular cantilever beams in plan is subjected to uniformly distributed load w/unit run throughout its length. Draw shear force bending moment and torsion moment diagram **(7)**

**(B)** Determine the shape factor for I section having flange of 110mmx10mm bottom flange 110mmx10mm and a web 10x130mm **(7)**

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

**(A)** Analyse circular beam on several supports in plan. **(7)**

**(B)** A conical dome has 9m span and 4.5 m. rise. it has a thickness of 100mm. it is subjected to load of 4900 N/m2 including self weight and a concentrated load at vertex of 9000N .calculate stresses in the dome. **(7)**

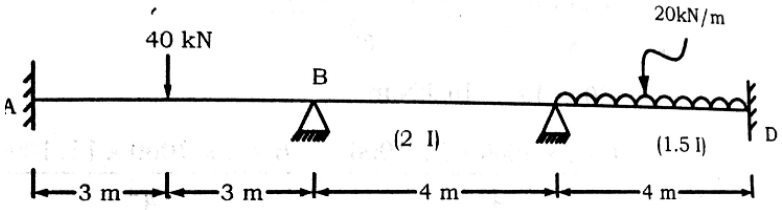
**Q-6** **Attempt all questions** **(14)**

**(A)** Explain methods of prestressing **6**

**(B)** A simply supported prestressed concrete beam 10m span. Rectangular section 600x900 mm is subjected to prestressing force of 5600kN 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 80kN/m. consider losses 15% .draw stresses distribution diagram at mid span. **8**

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

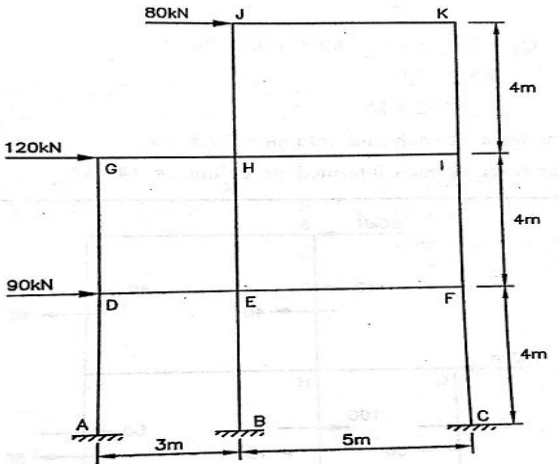
**(A)** For a continuous beam , show in fig support B sinks by 12mm and support C sinks by 15 mm. analyze the beam by stiffness matrix method.(EI=7000 KN.m$^2$). **8**




**(B)** Write short note on kinematic indetrminancy **6**

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

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


80kN
J
K
4m
120kN
G
H
I
4m
90kN
D
E
F
4m
A
B
C
3m
5m