Enrollment No: _____ Exam Seat No:_____

C.U.SHAH UNIVERSITY

Summer Examination-2016

Subject Name : Structural analysis- III

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

Semester :5 **Date :25/04/2016** **Time :02:30 To 05:30** **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) Give the SI of fixed beam. 1
b) Draw the figure of prestressing. 1
c) Give the types of domes 1
d) Draw the figure of posttensioning 1
e) Give the two advantages of prestressed concrete 1
f) Give the two losses in prestress 1
g) Write definition of following terms 8

- Tendon
- Meridional
- Axial prstressing
- Anchorage
- Full prestressing
- Shape factor
- Stiffness
- Plastic hinge

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

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

a) A roof of a hall having diameter 20 m is to be covered by a conical dome of 100 mm thickness and 4 m rise. Assuming live load and other loads as 1.5 kN/m^2, calculate stresses in the dome. **7**

b) A beam in plan has radius of 8 m and is supported at equally spaced 8 supports. It is loaded by a udl of 40 kN/m. Calculate the maximum values of BM, shear force and torsion moment. **7**

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

a) Difference between stiffness & flexibility method. **7**

	b)	Write down the rotational matrix for plane frame , plane truss and space frame.	**7**
Q-4		**Attempt all questions**	**(14)**
	a)	A prestressed concrete I-beam has its upper flange 750 mm × 200 mm, lower flange 400 mm × 300 mm and web of 150 mm width and 500 mm depth. It is supported over a span of 30 m and carries u.d.l of 4 kN/m, exclusive of self-weight. It is prestressed with 120 wires of 5 mm diameter each, with their centroid 100 mm from the soffit and initially tensioned to 1000 N/mm^2. Assuming 15 % loss in prestress. Determine the extreme fibre stresses at mid span for {prestress + self weight }	**7**
	b)	From the above question 4(a), determine the extreme fibre stresses at mid span for {prestress + self weight + live load}	**7**
Q-5		**Attempt all questions**	**(14)**
	(a)	A propped cantilever beam is having 10m span. Draw Influence line diagram for SF at section 4 m from the fixed end.	**8**
	(b)	Calculate the BM for the above question 5(a), and draw ILD for BM at section 4 m from the fixed end.	**6**
Q-6		**Attempt all questions**	**(14)**
	(a)	Calculate the shape factor for the hollow rectangular section having outer dimension 300 mm × 150 mm and thickness 10 mm.	**7**
	(b)	Give the differences between qualitative & quantitative influence line.	**7**
Q-7		**Attempt all questions**	**(14)**
		Analyze the building fram eshown in fig.1 by approximate method and draw shear force, bending moment and axial force diagrams.	

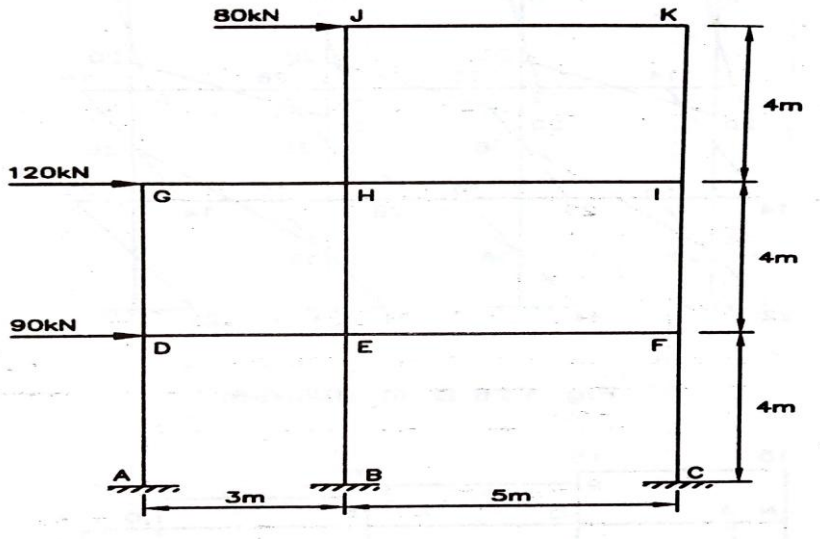

Figure-1

Q-8 **Attempt all questions**

Analyses the building frame as shown in fig.2 by cantilever method and draw SFD & BMD. The area of inner columns is 1.25 times the area of outer column. **14**

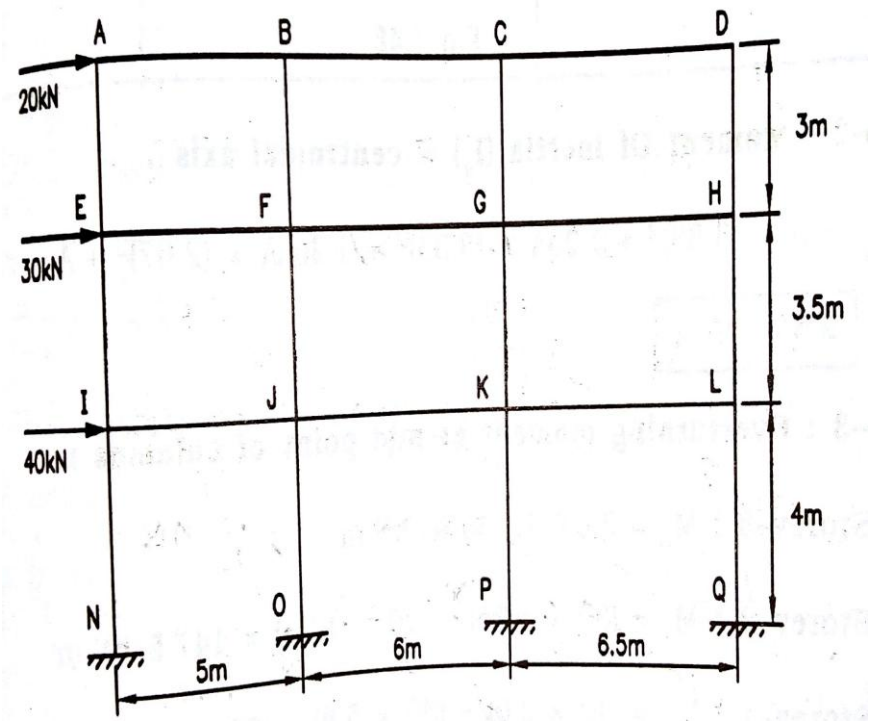

Figure-2