JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech II Year II Semester Examinations, November/December - 2020
STRUCTURAL ANALYSIS – I
(Civil Engineering)
Time: 2 Hours   Max. Marks: 75
Answer any Five Questions
All Questions Carry Equal Marks
- - -

1. A plane truss, made up of equilateral triangles of side 3 m, is supported and loaded as shown in Fig.1. Using the method of sections, determine the forces in the members 1, 2 and 3. [15]
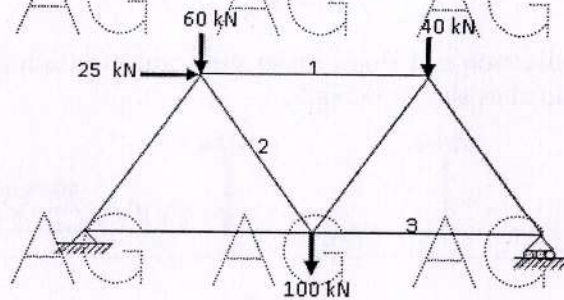

Fig.1

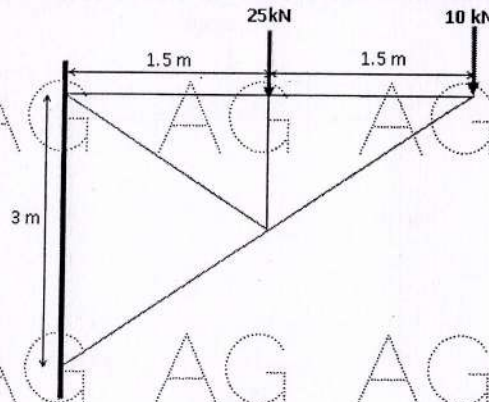2. Analyse the plane truss shown in Fig.2, using tension coefficient method. [15]

Fig.2

3. Using unit load method, determine the deflection under the concentrated load and the slope at the right hand side support of a beam, span 6 m, supported and loaded as shown in Fig. 3. [15]
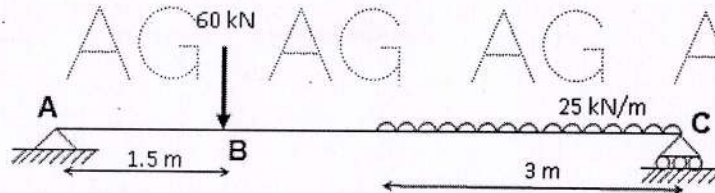

Fig. 3

4. A three-hinged circular arch of span 30 m and a central rise of 6 m is subjected to two concentrated loads 150 kN and 100 kN at a distance of 8 m and 18 m from the left hinge. Find the support reactions and the horizontal thrust at a section 12 m from the right support. [15]

5. Find the maximum deflection and the slope at the prop of a beam supported and loaded as shown in Fig.4. [15]
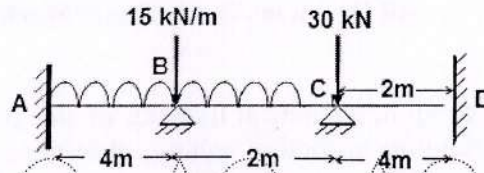
15 kN/m   30 kN

A B C —2m→ D

← 4m → — 2m —×— 4m →

Fig.4

6. Determine the deflection and slope, under the point of action of 50 kN load, of a beam supported and loaded as shown in Fig.5. [15]
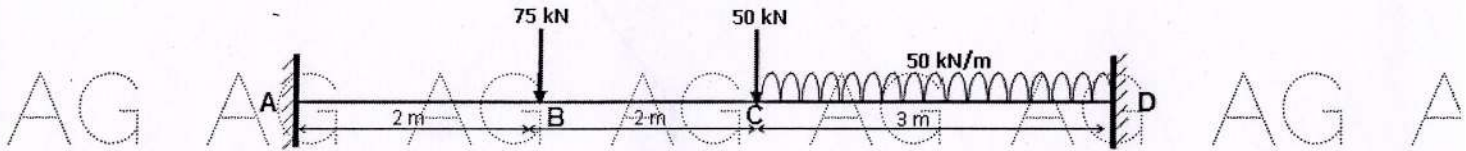
75 kN   50 kN

50 kN/m

A   B   C   D

2 m   2 m   3 m

Fig.5

7. Using the slope-deflection method, analyse the frame shown in Fig. 6. [15]
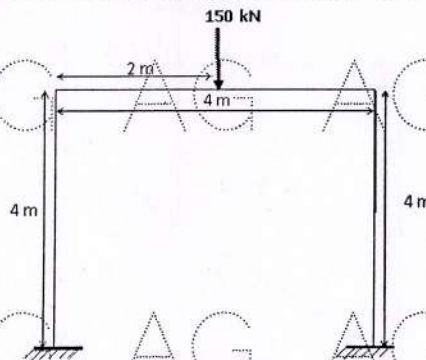
150 kN

2 m

4 m

4 m   4 m

Fig. 6

8. An uniformly distributed load of intensity 20 kN/m, 5 m long crosses a simply supported girder of span 24 m from left to right. Calculate the maximum positive and negative shear forces at a section 10 m from the right support. [15]

---ooOoo---