G 1033   (Pages : 2)

B.TECH. DEGREE EXAMINATION, MAY 2016

Sixth Semester

Branch : Civil Engineering

STRUCTURAL ANALYSIS—III (C)

(Old Scheme—Prior to 2010 Admissions)

[Supplementary/Mercy Chance]

Time : Three Hours   Maximum : 100 Marks

Answer **all** *questions.*

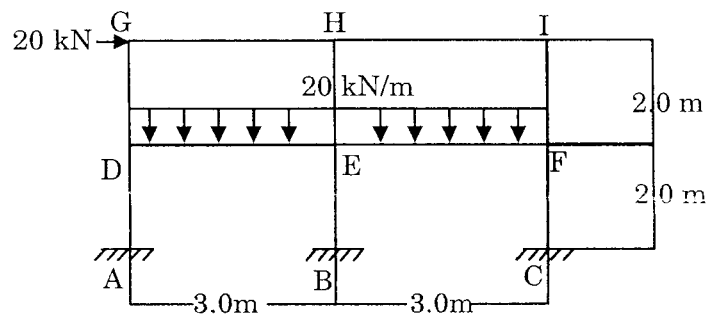1. Analyse the frame in Fig. 1 using portal method.

Fig. 1

(20 marks)

Or

2. Analyse the frame in Fig. 1 using cantilever method.   (20 marks)

3. Analyse the beam in Fig. 2 below using Kani's method.

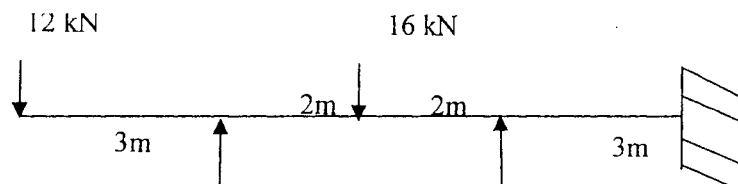**Fig. 2**

(20 marks)

Or

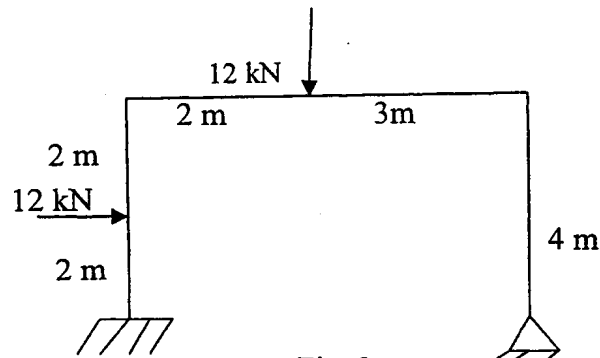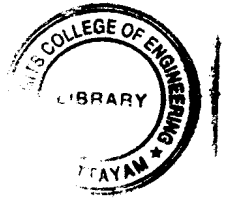4. Analyse frame shown in Fig. 3 below using Kani's method :

Fig. 3

(20 marks)

5. (a) Explain state of stress at a point. (10 marks)

   (b) What is stress tensor ? (4 marks)

   (c) Derive the equilibrium equation. (6 marks)

Or

6. (a) Explain transformation of stresses. (10 marks)

   (b) Define principal stress. (4 marks)

   (c) Explain compatibility equations. (6 marks)

7. A cantilever beam of rectangular cross-section 150 mm. × 250 mm. is 2 m. in length. Find stresses at mid-span using elasticity theory if it carries a load of 2 kN at free end.

(20 marks)

Or

8. (a) Explain Airy's stress function. (10 marks)

   (b) Describe Biharminic equations. (10 marks)

9. (a) Find the shape factor for an inverted 'T' beam with flange size as 100 × 10 mm. and web size as 10 mm. × 90 mm. also find the fully plastic moment if f_y = 250 Mpa.

(16 marks)

   (b) Define the following terms : (i) Plastic moment ; and (ii) Plastic hinge. (4 marks)

Or

10. Determine shape factor for the following section :

   (a) Circular section. (b) Rectangular section.

   (c) Symmetric triangular section.

(20 marks)

[5 × 20 = 100 marks]