G 372 (Pages : 4) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2014

Sixth Semester

Branch : Civil Engineering

CE 010 603—STRUCTURAL ANALYSIS—II (CE)

(New Scheme—2010 Admission onwards)

[Regular/Improvement/Supplementary]

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions.*
Each question carries 3 *marks.*

1. What is load factor ?
2. Explain substitute Frame Method.
3. Explain Kanis method for frames.
4. What is stress tensor ?
5. What is Natural frequency ?

(5 × 3 = 15 marks)

Part B

Answer **all** *questions.*
Each question carries 5 *marks.*

6. Explain lower bound and upper bound theorem in plastic Analysis.
7. Explain briefly tension coefficient method applied to space frames.
8. Briefly explain Muller Breslau's principle.
9. Find the principle stresses for the stress matrix shown below. All values are in MPa.

$$\begin{bmatrix} 8 & 5 & 2 \\ 5 & 4 & 1 \\ 2 & 1 & 3 \end{bmatrix}.$$

10. Explain free or natural vibrations.

(5 × 5 = 25 marks)

Turn over

Part C

Answer **all** *questions.*
Each question carries 12 *marks.*

11. Determine Collapse load in fixed beam shown in Fig. 1.

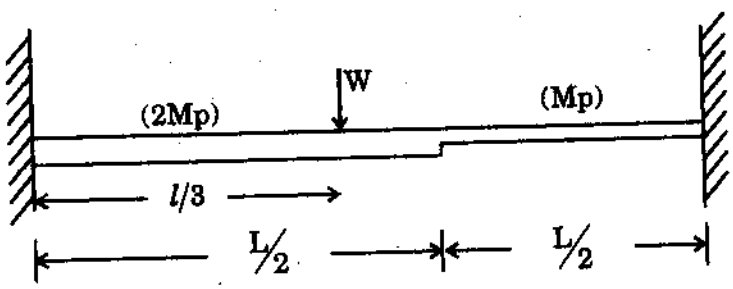


Fig. 1

(12 marks)

Or

12. Determine plastic moment capacity of frame for loading as given in Fig. 2.

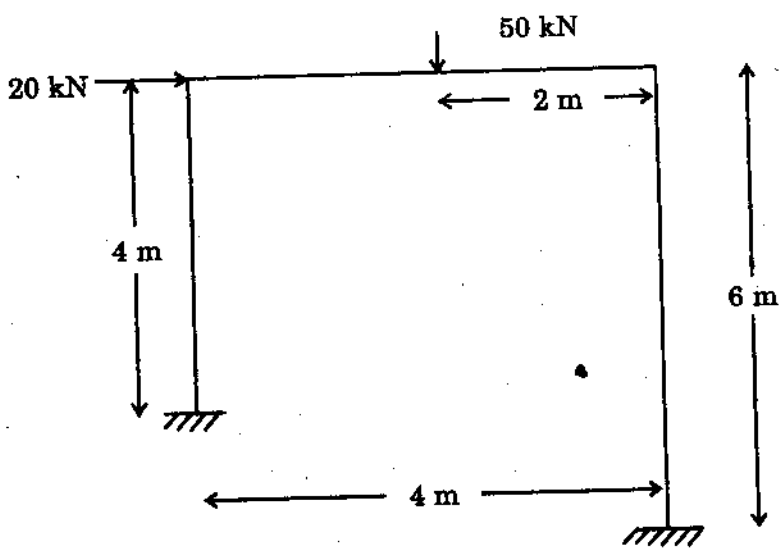
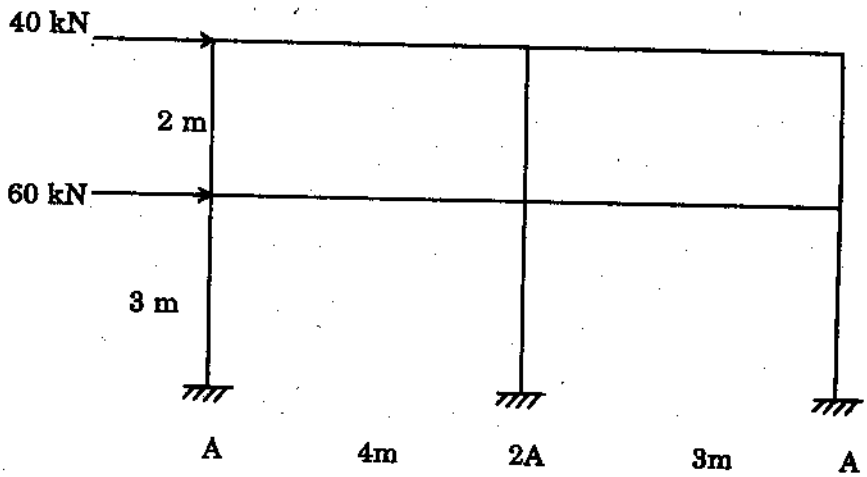


Fig. 2

(12 marks)

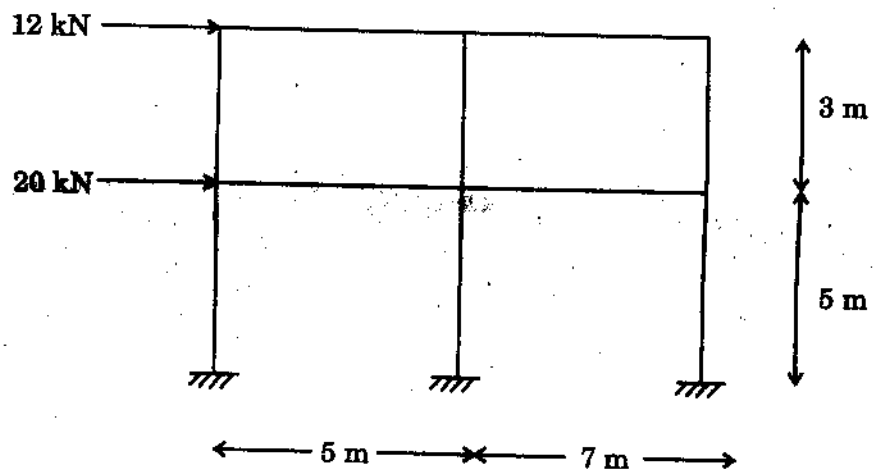
13. Analyse the frame using cantilever method :



(12 marks)

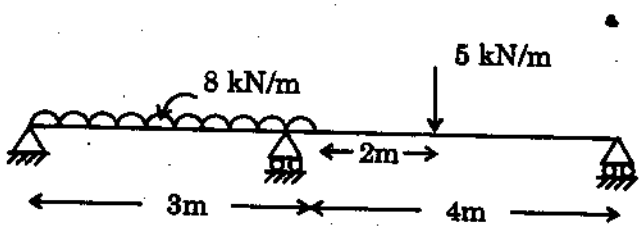
Or

14. Analyse frame using Portal method :



(12 marks)

15. Analyse using Kanis method :



(12 marks)

Or

16. Draw ILD for SF and reaction at B in a continuous beam ABC, pinned at A, with roller support at B and C. Span AB is 7m. and span BC is 6 m.

(12 marks)

17. Explain :

(i) Plane stress and plane strain problems.

(ii) Stresses on arbitrary plane.

(12 marks)

Or

18. State of stress at a point is given by : (12 marks)

$H\sigma_x = 250 \quad \sigma_y = -150 \quad \sigma_2 = 60$

$\tau_{xy} = 40 \quad \tau_{yz} = 50 \quad \tau_{xz} = 60$ MPa

If $E = 2 \times 10^5$ N/mm^2. and $G = 0.75 \times 10^5$ N/mm^2, determine strain components.

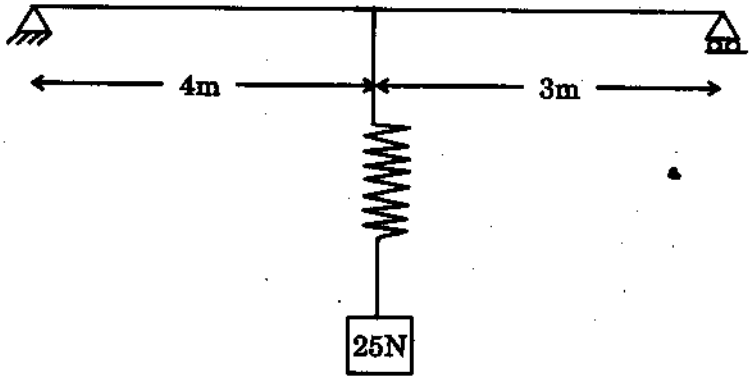
(12 marks)

19. Briefly explain D'Alembert's principle and derive spring stiffnes for a parallel connection.

(12 marks)

Or

20. Find the natural frequency of the system shown the mass of beam is negligible in comparison to the suspended mass. Take $E = 2 \times 10^5$ N/mm^2. The cross-section of beam has following dimensions $b = 120$ mm., $d = 160$ mm.



(12 marks)

[5 × 12 = 60 marks]