

B.E. (Civil Engineering) Eighth Semester (C.B.S.)
Elective - II : Advanced Structural Analysis

P. Pages : 2

NRJ/KW/17/4668

Time : Three Hours



Max. Marks : 80

- Notes :
1. All questions carry marks as indicated.
 2. Solve Question 1 OR Questions No. 2.
 3. Solve Question 3 OR Questions No. 4.
 4. Solve Question 5 OR Questions No. 6.
 5. Solve Question 7 OR Questions No. 8.
 6. Solve Question 9 OR Questions No. 10.
 7. Solve Question 11 OR Questions No. 12.
 8. Assume suitable data whenever necessary.

1. Write a program for beams on Elastic Foundation by giving suitable example. 13

OR

2. Derive an expression for circular beam subjected to uniformly distributed load 'w' in kN/m and supported on symmetrically placed column. Find out max^m bending moment and maximum torsional moment. 13

3. Analyse the plane frame as shown in fig. 1. 14

$E = 25.5 \times 10^6 \text{ kN/m}^2$

$b = 35 \text{ cm}$

$d = 60 \text{ cm}$

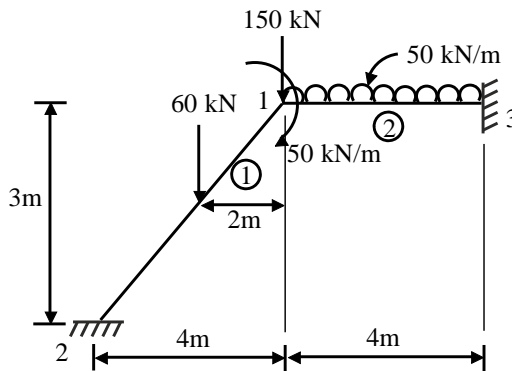


Fig. 1

OR

4. Assemble global stiffness matrix and global load matrix for the plane frame as shown in fig. 2. $E = 22 \times 10^6 \text{ kN/m}^2$, $b = 300 \text{ mm}$, $d = 600 \text{ mm}$ for all members. 14

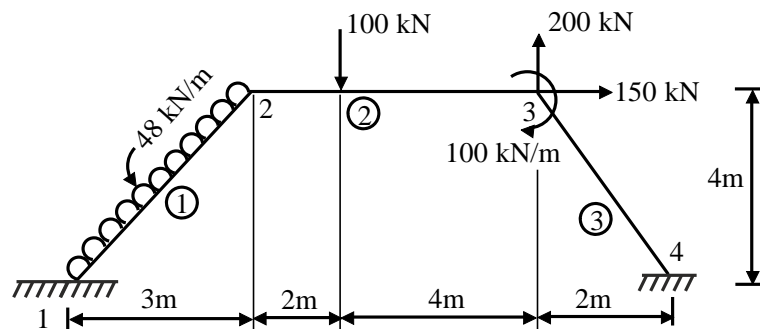


Fig. 2

5. Analyse the plane Grid as shown in fig. 3. 14

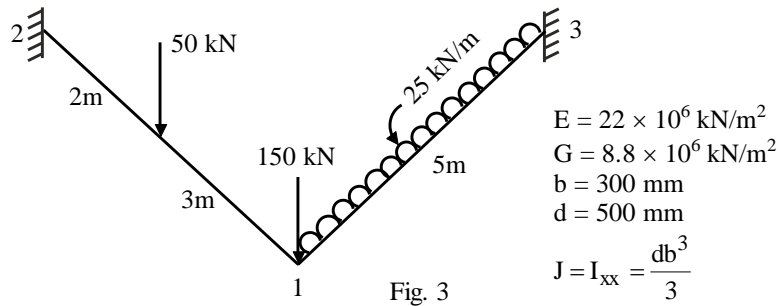


Fig. 3

OR

6. Find the displacement at node 2 of the grid structure as shown in fig. 4. Member 1 is landed with uDL of 20 kN/m and on member 2 concentrated land of 50 kN is acting at centre. $E = 2.54 \times 10^7 \text{ kN/m}^2$, $G = 8.8 \times 10^6 \text{ kN/m}^2$ c/s of beam = $300 \times 600 \text{ mm}$ and $I_{xx} = db^3/3$. 14

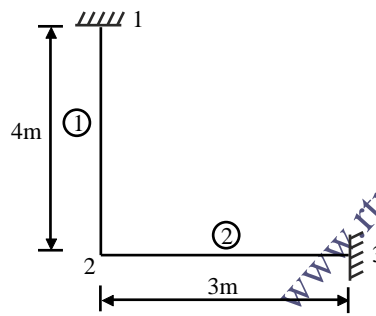


Fig. 4

7. a) What is transmissibility? Derive the equation of transmissibility. 6
 b) Derive the transient and steady state response for undamped single degree of freedom system subjected to harmonic loading. 7

OR

8. a) Explain the terms : 6
 i) Critical Damping ii) Over Damping
 iii) Mathematical model for damped system.
 b) Derive equation for response in free vibration of an undamped single degree of freedom system. 7

9. a) Explain "DUHAMEL's" integral in references to impulsive landing and derive the expression for DLF for a rectangular loading. 7
 b) Draw the first three mode shapes for a beam fixed at one end and free at the other. 6

OR

10. a) Explain "DUHAMEL's" integral in references to impulsive landing and derive the expression for DLF for triangular land. 7
 b) Explain approximate method for analysis of impulsive landing. 6

11. a) Explain in detail "Is codal coefficient method" 8
 b) Explain need of Earthquake analysis of structure and need of standard code. 5

OR

12. a) Explain the Guidelines of Earthquake resistant design. 6
 b) Explain in brief about Seismic Zones of India. 7
