SIXTH SEMESTER B.TECH DEGREE EXAMINATION, APRIL 2013

MODEL QUESTION PAPER

Branch **:** Civil Engineering

CE010603 STRUCTURAL ANALYSIS-II

Time**:** Three Hours Maximum : 100 Marks

PART A (Answer all) (3X5=15Marks)

1. What is shape factor?
2. Differentiate between portal method and cantilever method
3. Describe influence line diagram
4. Differentiate between plane stress and plane strain problems
5. What is resonance?

PART B(Answer all) (5X5=25Marks)

1. Compare the upper and lower bound theorem in plastic analysis.
2. Determine the forces in members AB and CB using tension coefficient method. L_{AB}= 1.5m, L_{AC}=2m

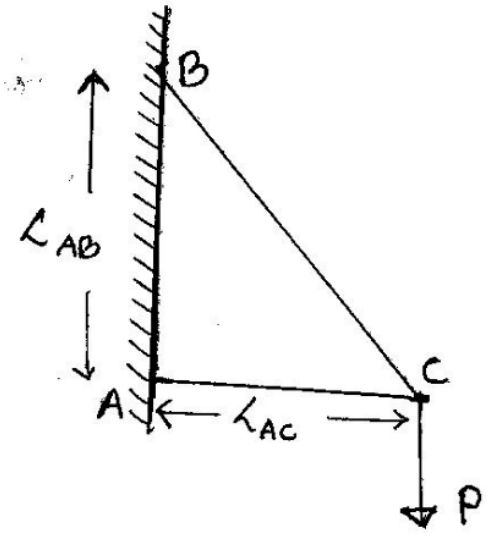

Fig:1

3. State and prove Muller-Breslau principle

4. Find the principle stresses for the stress matrix shown below. All values are in MPa

$$\begin{pmatrix} 9 & 6 & 3 \\ 6 & 5 & 2 \\ 3 & 2 & 4 \end{pmatrix}$$

5. Derive the equivalent spring stiffness for a parallel connection

PART C (12X5=60Marks)

1. a)Determine the plastic moment capacity of the beam shown in Fig 2

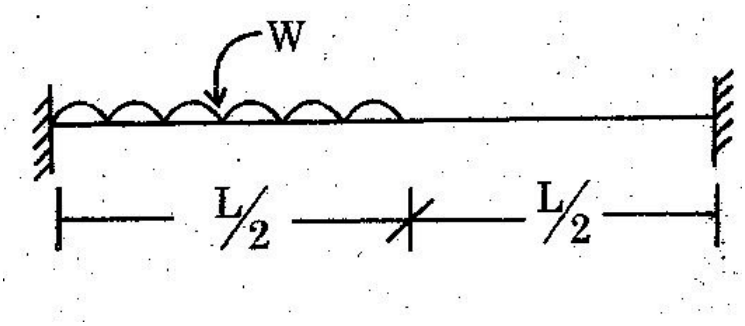

Fig:2

OR

b) Determine the minimum plastic moment capacity of the frame to prevent collapse

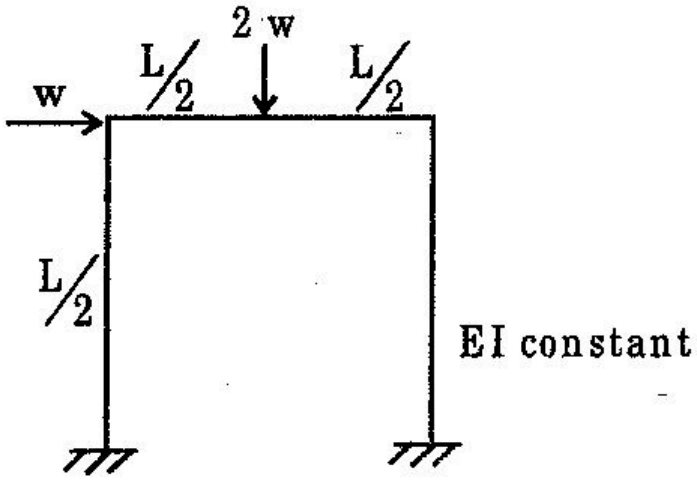

Fig:3

2. a) Analyze the frame using cantilever method

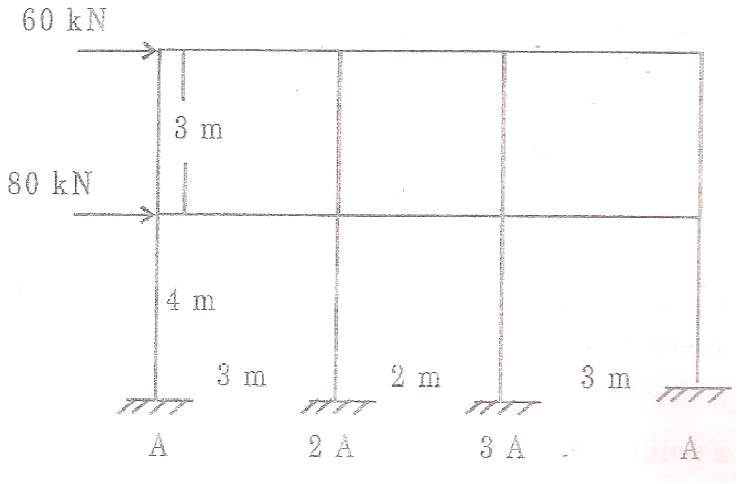

Fig:4

OR

b) Analyze the frame using portal method

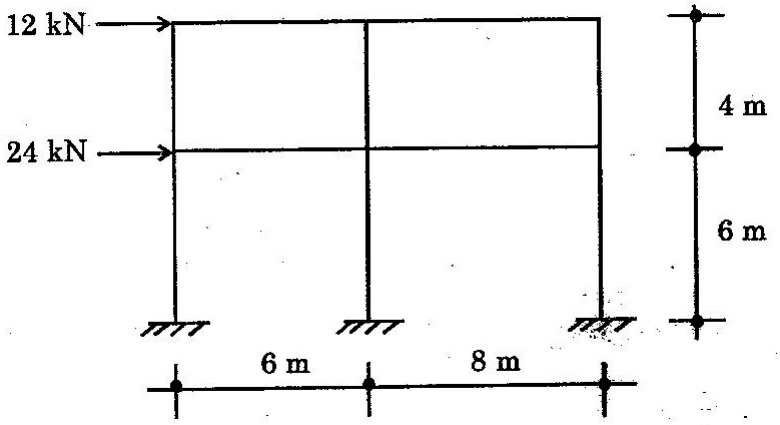

Fig:5

3. a) Analyze using Kani's method

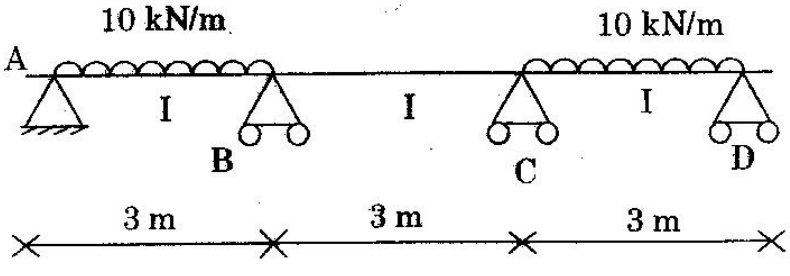

Fig 6

OR

b) Draw the influence line diagram for reaction at B in a continuous beam ABC, pinned at A, with roller support at B and C. Span AB is 6m and span BC is 5m.

4. a) Explain Airy's stress functions

OR

b) State of stress at a point is given by :

H σ_x= 200 σ_y= -100 σ_z= 50 τ_{xy}=40 τ_{yz}=50τ_{xz}=60MPa. If E=2.05x10^5 N/mm^2 and G=.8x10^5 N/mm^2, determine the strain components.

5. A) Derive the equation of motion for a single degree of freedom system.

OR

b) Find the natural frequency of the system shown. The mass of the beam is negligible in comparison to the suspended mass. Take E= 2.1x10^5 N/mm^2. The cross section of the beam has the following dimensions. b= 100mm d= 150mm