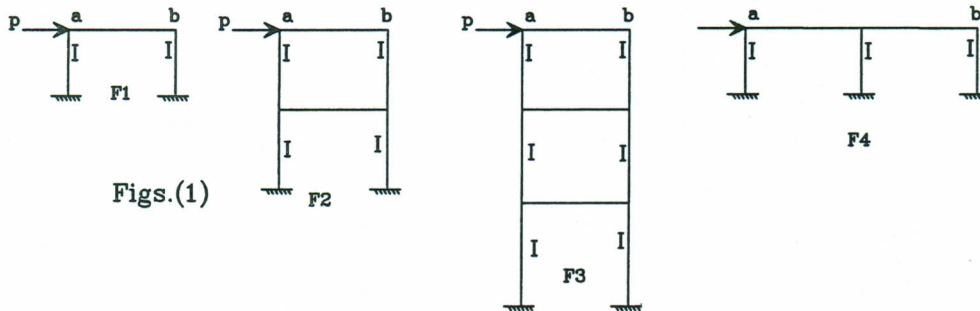


Any data missing may be assumed

MAXIMUM CREDIT = 50 POINTS

Question 1: 12 Points.

- i) Distinguish between plane frame and grid structures. 2 Pts.
- ii) Give the difference between static and dynamic analysis of structures. 2 Pts
- iii) Write shortly about:
 - a) The relation between stiffness matrix and flexibility matrix. 1 Pts.
 - b) The nonlinear analysis of structures and types of nonlinearity. 2 Pts.
- vi) Give a short definition about stiffness, mass, and damping coefficients 2 Pts
- v) Write the slope deflection equation in case of with and without axial effect. 1 Pts
- iv) Which frame having the smallest sway at level ab and other having the biggest for the frames shown in Figs.(1) and why? 2 Pts.



Figs.(1)

Question 2: 12 Points.

Find the period of vibration for the following structures :

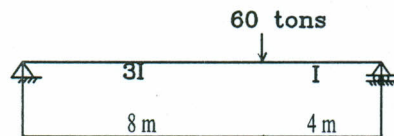


Fig.(2a)

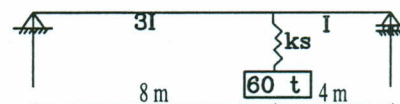


Fig.(2b)

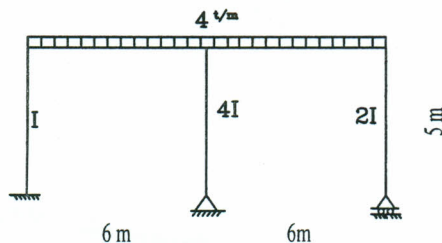


Fig.(2c)

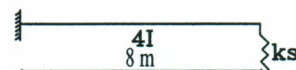


Fig.(2d)

$E = 2000 \text{ t/cm}^2$, $I = 0.0005 \text{ m}^4$, and $ks = 1000 \text{ t/m}$