

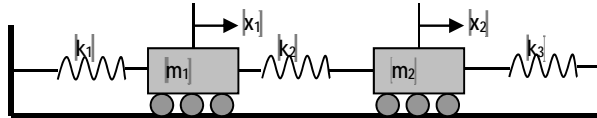
NPTEL course offered by IIT Madras
Computer methods of analysis of offshore structures

Tutorial 9: Dynamic analysis

Answer all questions

Total marks: 25

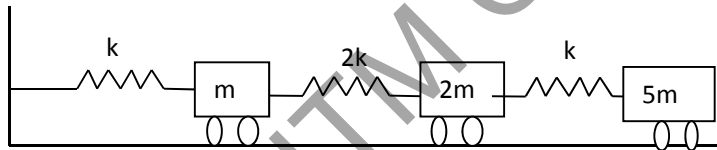
1. What are essential characteristics of a dynamic system?
2. Determine the influence co-efficient matrix for the multi-degrees-of-freedom system shown in the below figure:



3. Determine the fundamental frequency of the system whose $[M]$ and influence coefficient matrix $\bar{\delta}$ are given as below:

$$M = \begin{bmatrix} 60 & 0 & 0 \\ 0 & 100 & 0 \\ 0 & 0 & 80 \end{bmatrix}, [\bar{\delta}] = \begin{bmatrix} 6 & 5 & 3 \\ 5 & 7 & 4 \\ 3 & 4 & 6 \end{bmatrix}$$

4. Evaluate the frequency and mode shape for the MDOF system using Influence coefficient method. Use Dunkerley's method to evaluate natural frequency of the system.



$$m = 35 \text{ kN}; K = 1000 \text{ kN/m}$$

5. Evaluate the fundamental frequency and mode shape for the MDOF system using Stodola method.

