

COURSE LEARNING OUTCOME

Able to develop simplified models or their equivalent, of simple real system.	CO1	PO1,2,4
Able to develop analytical model for analysis.	CO2	PO1,2,4
Able to understand the concept of modes and mode shapes.	CO3	PO1,2,4
Able to understand the basic concept and techniques used in vibration control.	CO4	PO1,2,4
Able to perform simple vibration test and measurement.	CO5	PO1,2,3

SECTION A

QUESTION 1 (25 marks)

Free Vibration occurs when a system oscillates only under an initial disturbance with no external forces acting after the initial disturbance.

- Explain the principle of conservation of energy. **(CO1-2; PO1 - 2 Marks)**
- For Free Vibration of undamped translational system, derive the following relation $m\ddot{x} + kx = 0$ based on Principle of Conservation of Energy method **(CO1; PO2 -3 Marks)**
- By using the principle of conservation of energy, determine the natural frequency of the spring-mass system as shown in the **Figure Q1(c)**. **(CO2; PO4 -10 Marks)**

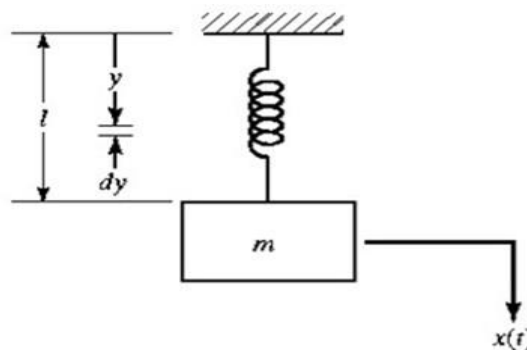


Figure Q1(c)