JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TERM 1 EXAMINATIONS–2022

M.Tech.– I Semester (Structural Engineering)

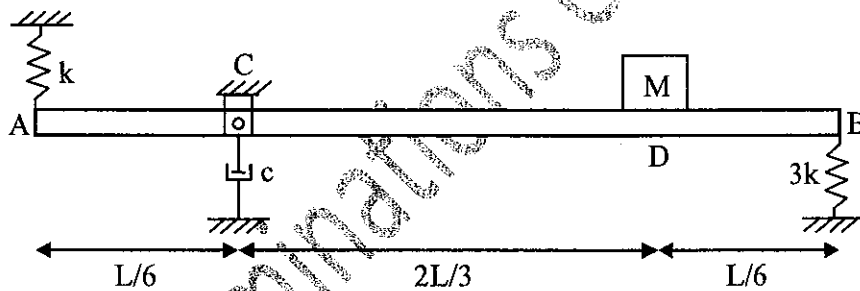COURSE CODE (CREDITS): 11M1WCE112 (3)　　　　　　　　MAX. MARKS: 15

COURSE NAME: Structural Dynamics

COURSE INSTRUCTOR: Sugandha Singh　　　　　　　　MAX. TIME: 1 Hour

Note: All questions are compulsory. Marks are indicated against each question in square brackets.

1. What is the effect of weight in a suspended mass–spring system in its equation of motion? Show calculations. **[2 marks]**
2. Explain the principle behind the working of a music box. **[3 marks]**
3. Write the equation of motion of the following system. Assume that the mass per unit length is $\bar{m}$. **[5 marks]**

4. What is Logarithmic Decrement *(δ)*? Assuming that the displacement of a Damped System undergoing free vibrations as given by equation below, derive the relationship between Logarithmic Decrement *(δ)* and Damping Ratio *(ξ)*. **[5 marks]**

$$u(t) = e^{-\xi \omega t}(A \cos \omega_D t + B \sin \omega_D t)$$