

Name of the Examinations: M.E. CIVIL ENGINEERING FIRST YEAR FIRST SEMESTER  
2025

Subject : DYNAMICS OF STRUCTURES (SE)

Time : 3 Hours

Full Marks : 100

- Using the variational form for the KE, PE and non-conservative work in the Hamiltonian obtain the governing differential equation for the beam shown in Fig. 1. Also explain the significance of the boundary condition equations. (20)
- Using Laplace Transform obtain the response of a damped SDOF system subjected to a load shown in Fig. 2 (15)
- Define Power Spectral Density (PSD) function. State the properties of PSD function. (2+8)
- For a dynamic system if the PSD function for the input is expressed as  $S_f(\omega)$  obtain the expression for the response PSD. (20)
- Define (i) Narrow Band Random Process (ii) White Noise (iii) Broad Band Random Process (iv) Stationary and Ergodic Random Process (v) Probability Distribution Function and its properties (10)
- Obtain the Response Spectrum for an undamped SDOF subjected to a load shown in Fig. 3 (25)

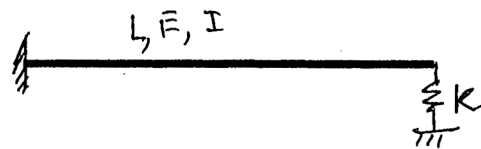


Fig. 1

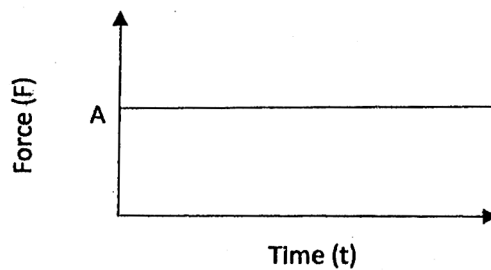


Fig. 2

