Exam.Code:1015
Sub. Code: 7446

2063
M.E. (Mechanical Engineering)
Second Semester
MME-204: Structural Dynamics

Time allowed: 3 Hours **Max. Marks: 50**

NOTE: Attempt five questions in all, selecting atleast two questions from each Part. Supplement your answer with suitable sketches wherever required. Assume any missing data suitably.

x-x-x

Part-A

1 Compare Receptance, Mobility and Accelerance frequency response functions in absolute as well as dB scales. (10)

2 Write a MATLAB program for plotting displacement response of SDOF system. (10)

3 Which of the following is a good design choice for a Hydraulic Door Closer? Why? (10)
(i) Underdamped system
(ii) Overdamped system
(iii) Critically damped system
Design a numerical example to demonstrate the design procedure applicable for a Hydraulic Door Closer.

4 Why are vibrometers designed to be heavy weight, while the accelerometers are designed to be light weight? Justify based on design criterion applicable. (10)

Part-B

5 Formulate the linear shape functions for a bar element applicable in FEM. (10)

6 Develop global elemental traction force vector for a bar having ten elements. (10)

7 Write a MATLAB program to develop global stiffness matrix of a cantilever beam. (10)

8 Find first five natural frequencies and mode-shapes of a simply supported beam of aluminium material having dimensions 0.05 x 0.005 x 0.5 m. (10)

x-x-x