Exam.Code:1015
Sub. Code: 7763

2072

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 Unit. Supplement your answer with suitable sketches wherever required. Assume any missing data suitably*

x-x-x

UNIT – I

I. Draw and compare the three-dimensional waterfall based FRF diagram applicable for a simply supported beam type product using dB scale versus absolute scale. Which one should be preferred and why? (10)

II. Draw and compare drive point versus cross FRFs. (10)

III. Derive the governing equation of a 2-DOF system. Also find its solution. (10)

IV. Design a critically-damped spring-mass-damper system with following constraints: Mass of the system can vary between 10 to 13 kg; Spring stiffness may be kept between 1000 to 2000 N/m. Also plot the response of the system in a graphical form. First natural frequency of the system should be as high as possible. (10)

UNIT - II

V. Name at least five seismic instruments. Also discuss the detailed working of any one of these. (10)

VI. Write a MATLAB program for Newmark beta method. (10)

VII. Demonstrate the application of shape functions in finite element analysis of beams. (10)

VIII. Find first three natural frequencies and mode-shapes of a fixed-fixed beam of mild-steel material having dimensions 0.02 x 0.002 x 0.2 m. (10)

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