P118 -152 (TL)

G.R. No.	

OCTOBER 2018 / IN - SEM (T1)

F. Y. M. TECH. (Design Engineering) (SEMESTER - I)

COURSE NAME: Advanced Vibrations and Acoustics

COURSE CODE: MEPA11182

(PATTERN 2018)

Time: [1 Hour]   [Max. Marks: 20]

(*) Instructions to candidates:
1)   Answer Q.1 OR Q.2, Q.3 OR Q.4
2)   Figures to the right indicate full marks.
3)   Use of scientific calculator is allowed
4)   Use suitable data where ever required

Q.1) a) A mass of spring mass dashpot system is given an initial velocity of $A\omega_n$ Where ω_n is undamped natural frequency of the system. Find the equation of motion for a system when 1) $\xi=2.0$ 2) $\xi=0.2$. Draw the displacement time plot for these cases.   [6 marks]

b) Derive the relation for mass of spring and natural frequency   [4 marks]

OR

Q.2) a) A disc of torsional pendulum has a moment of inertia of 600 $kgcm^2$ and is immersed in viscous fluid. The brass shaft is attached to it is of 10 cm diameter and 40 cm long. When the pendulum is vibrating, the observed amplitude on the same side of rest position for clockwise cycle are $9^0, 6^0$ and 4^0. Determine. 1) Logarithmic decrement 2) Damping torque at unit velocity. Assume $G=4.4\times10^{10}N/m^2$. 3) What would be the frequency if the disc is removed from viscous fluid   [6 marks]

b) Explain magnification factor in brief   [4 marks]

Q.3) Explain the Eigen value and Eigen vector for multi degree freedom system, use this method to determine the three natural frequencies of the following system.   [10 marks]