

Course Code: 11M1WCE112

Max. Marks: 25

Course Name: *Structural Dynamics*

Course Credit: 03

Max. Time: 90 Minutes

Note: All questions are compulsory. Carrying of mobile phone during examination will be treated as case of unfair means. Assume any missing data.

Q.1 Derive an expression for the displacement response of undamped single degree of freedom system for an applied loading ($P(t)$) of intensity $P_0 \cos \omega t$. (2.0)

Q.2 Draw an expression for deformation response factor for an undamped and damped single degree of freedom system. (1.5+2)

Q.3 Plot an envelope curve for deformation response factor and phase angle with frequency ratio for undamped and damped single degree of freedom system. (2+2.5)

Q.4 Plot the response of dynamic magnification factor with varying frequency ratios. (Assume suitable values of system damping with respect to critical damping. (2)

Q.5 Draw the expressions along with plots for following:

A. Dynamic response factors; deformation, velocity, acceleration. (1.5+2.0+2.0)

B. Resonating frequencies and responses, deformation, velocity and acceleration (1.5+2.0+2.0)

Q.6 Define following

A. Transmissibility (1/2)

B. Periodic loading (1/2)

C. Steady state vibration (1/2)

D. Transient vibration (1/2)