

BMM3553 Mechanical Vibrations

Assignment 1 (Single Degree of Freedom)

by

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Question 1

□ Vibration response of a single degree of freedom system can be write as $x(t) = -3 \sin 5t - 2 \cos 5t$. Convert the vibration response into the form of $x(t) = A \cos (5t + \emptyset)$.

□ **(5 Marks)**

□ A harmonic force of $F(t) = 180 \sin 5t$ N act on a spring-mass-damper system ($k = 1500$ N/m; $m = 10$ kg; $c = 50$ N-s/m). If the system vibrate with the initial displacement and velocity of 15mm and 5 m/s, determine the total response of the system.

(20 Marks)

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