PH 203 – Classical Mechanics, Dr. M. K. Nandy, Quiz-2, 10 November 2023

1. For a one-dimensional undamped simple harmonic oscillator

   (a) Write the Hamiltonian.

   (b) Write the Hamilton-Jacobi equation.

   (c) Implement separation-of-variables and solve the Hamilton-Jacobi equation.

2. A one-dimensional undamped simple harmonic oscillator (of natural frequency ω) is subjeted to a periodic force $F = F_0 \cos \Omega t$. (Note: $\Omega \neq \omega$.)

   (a) Write the equation-of-motion. Include the periodic force.

   (b) Write the solution of the homogeneous part.

   (c) Find the particular integral with amplitude in terms of the frequencies.