Date:

Assignment 3

Roll no. = 2020101001

$k = (2020101001 \,\%\, 3) + 1 = 2$

$m = (2020101001 \,\%\, 5) + 1 = 2$

$x_0 = (2020101001 \,\%\, 7) + 1 = 3$

$\omega = \sqrt{\frac{k}{m}} = 1$

$T = \frac{2\pi}{\omega} = 2\pi \cong 6.28$.

Task 1.

$$H = \frac{1}{2}kx^2 + \frac{p^2}{2m}$$

$$F = \frac{-\partial H}{\partial x} = -\frac{\partial}{\partial x}\left\{\frac{1}{2}kx^2 + \frac{p^2}{2m}\right\}$$

$$= -\frac{1}{2}k(2x)$$

$$= -Kx \quad \rightarrow (1)$$

$$v = \frac{\partial H}{\partial p} = \frac{\partial}{\partial p}\left\{\frac{1}{2}kx^2 + \frac{p^2}{2m}\right\}$$

$$= \frac{2p}{2m}$$

$$= p/m \quad \rightarrow (2)$$