Chapter 16 - Reminder

1- The **frequency** of **Simple Harmonic Motion** (SHM) is defined as number of cycle (oscillation) in 1 second: $f = \frac{1}{T}$

2- The **SI unit measurement** of the frequency is scond^{-1} = Hz

3- The general formula of the **displacement of SHM** is: $x(t) = x_m \cos(\omega t + \phi)$

4- The **angular frequency of SHM** is: $\omega = 2\pi f$ (The SI unit of ω is rad/s)

5- The **velocity of SHM** is: $v(t) = -\omega x_m \sin(\omega t + \phi)$

6- The **acceleration of SHM** is: $a(t) = -\omega^2 x(t)$

7- The **force of SHM** is: $F(t) = m\,a(t) = -\omega^2 m\,x(t)$

8- The **angular frequency of the Spring motion** is : $\omega = \sqrt{\frac{k}{m}}$

9- The **potential energy** of the Spring motion is: $U(t) = \frac{1}{2} k x^2 = \frac{1}{2} k x_m^2 \cos^2(\omega t + \phi)$

10- The **kinetic energy** of the Spring motion is: $K(t) = \frac{1}{2} m v^2 = \frac{1}{2} m \omega^2 x_m^2 \sin^2(\omega t + \phi)$

11- The **mechanical energy** of the Spring motion is: $E(t) = U(t) + K(t) = \frac{1}{2} k x_m^2$

12- The **angular frequency of mass point pendulum motion** with small angle is: $\omega = \sqrt{\frac{g}{L}}$

13- The **angular frequency of compound pendulum motion** (Physical pendulum motion) is: $\omega = \sqrt{\frac{m g h}{I}}$