Assignment for Module-1

1. **Answer following questions, in brief.**
   - **a.** LC Oscillator is an example of Electrical Simple Harmonic Oscillator. What is the angular frequency and time period of the oscillator?
   - **b.** What is damped harmonic oscillator? Write the equation and define each term with a real life example.
   - **c.** What is forced electrical harmonic oscillator? Write the equation and define each term with a real life example.
   - **d.** Define quality factor (Q-factor). What is its significance?
   - **e.** What is the relationship between sharpness of peak & Q-factor?
2. What is resonance in context of forced electrical simple harmonic oscillator? Derive an expression for resonant frequency.
3. Derive the expression for kinetic and potential energies of a linear harmonic oscillator located at x at any instant t, having amplitude a and angular velocity ω. Show that total energy is constant at all locations at any given moment.

Good Luck