INTRODUCTION TO ELECTRICAL ENGINEERING

WorkSheet-2

Unit 2: AC CIRCUITS

Choose the correct Answer

1. Form Factor is the ratio of

   (a) RMS Value/Peak Value (b) RMS Value/Average Value

   (c) Average Value/Peak Value (d) Average Value/RMS Value

2. The phase relationship between the voltage and current in a purely inductive AC circuit

   (a) The voltage leads the current by 90°.

   (b) The current leads the voltage by 90°.

   (c) The voltage and current are in phase.

   (d) The voltage and current are out of phase by 180°

3. In a series RLC circuit, resonance occurs when:

   (a) Capacitive reactance equals inductive reactance (=)

   (b) Impedance is purely capacitive

   (c) Impedance is purely inductive

   (d) Current is out of phase with the voltage

4. In a star-connected balanced three-phase system, the relationship between line voltage (V_L) and Phase voltage (V_{Ph})

   (a) $V_L = V_{Ph}$ (b) $V_L = \sqrt{3}\, V_{Ph}$ (c) $V_L = V_{Ph}/\sqrt{3}$ (d) $V_L = 3V_{Ph}$

5. The root mean square (RMS) value of an AC current is equivalent to

   (a) The average value of the current.

   (b) The peak value of the current.

   (c) The DC current that would produce the same amount of heat in a resistor.

   (d) The instantaneous value of the current

6. The phase relationship between the voltage and current in a purely resistive AC circuit?
   (a) The voltage leads the current by 90°.
   (b) The current leads the voltage by 90°.
   (c) The voltage and current are in phase.
   (d) The voltage and current are out of phase by 180°
7. The power factor of an AC circuit is defined as the ratio of
   (a) True power to apparent power. (b) Apparent power to true power.
   (c) Reactive power to true power. (d) Voltage to current
8. In a Delta-connected balanced three-phase system, the relationship between line current (I_L) and Phase current (I_{Ph})
   (a) $I_L = I_{Ph}$ (b) $I_L = \sqrt{3}\, I_{Ph}$ (c) $I_L = I_{Ph}/\sqrt{3}$ (d) $I_L = 3I_{Ph}$
9. The time taken by an alternating quantity to complete one cycle is known as
   (a) frequency (b) Time period
   (c) cycle (d) amplitude
10. Phasor representation in ac circuit analysis indicates
    (a) The instantaneous value of a sinusoidal waveform
    (b) The RMS value of a sinusoidal waveform
    (c)A complex number representation of both magnitude and phase angle of a sinusoidal waveform
    (d) The frequency of a sinusoidal waveform

Fill in the Blanks

11. A sine wave has a frequency of 50 Hz. Its angular frequency is _____ radians per second
12. For the purely capacitive AC circuits, The voltage _____ the current by 90°.
13. In a Delta-connected balanced three-phase system, the relationship between line voltage (V_L) and Phase voltage (V_{Ph}) is _____
14. At resonance in a series RLC circuit, the impedance is at its _____ value
15. The standard supply frequency in India is _____
16. In a series RLC circuit, resonance occurs when _____
17. For the purely inductive AC circuits, The voltage _____ the current by 90°.
18. In the power triangle, the formula represents the relationship between apparent power (S), real power (P), and reactive power (Q) is _____

19. Inductive reactance X_L= _____

20. Capacitive reactance X_C= _____

True/False

21. The maximum value of the waveform from its zero position is known as amplitude.

True /False

22. One complete set of positive and negative values of alternating quantity is known as a cycle. True /False

23. The unit of reactance is mho's. True /False

24. The power factor of a purely resistive AC circuit is zero. True /False

25. At resonance in a series RLC circuit, the impedance is minimum and the current is maximum. True /False

Match the Following

26. For RL circuit when excited with ac	a) Volt-Amperes (VA)
27. For RC circuit when excited with ac	b) current lags the voltage
28. Active power	c) current leads the voltage
29. Reactive power	d) watts (W)
30. Apparent power	e) Volt-Ampere Reactive (VAR)