

Name of the Student: _____

Question No. 1. Encircle the correct option.**(20)**

- i. At resonance frequency the current in RLC parallel circuit is
 - a. maximum
 - b. minimum
 - c. zero
 - d. no change in current
- ii. The most common source of alternating current is current
 - a. motor
 - b. generator
 - c. secondary cell
 - d. primary cell
- iii. An A.C. continuously flows through the plates of a capacitor because of
 - a. charging of plates
 - b. discharging of plates
 - c. dielectric
 - d. charging and discharging of plates
- iv. In a series resonance circuit, the behavior of the circuit at resonance frequency is
 - a. resistive
 - b. capacitive
 - c. Inductive
 - d. resistive-inductive
- v. How many types of modulation is
 - a. four
 - b. one
 - c. two
 - d. three
- vi. S.I. units of impedance is
 - a. henry
 - b. hertz
 - c. ampere
 - d. ohm
- vii. The rms value of current is equal to
 - a. $0.707 I_0$
 - b. $1/2 I_0$
 - c. $0.770 I_0$
 - d. $0.807 I_0$
- viii. The sum of -ve and +ve peak values is usually written as
 - a. p-n values
 - b. p-p values
 - c. rms values
 - d. cyclic values
- ix. The basic circuit element in a D.C. circuit is
 - a. an inductor
 - b. a capacitor
 - c. resistor
 - d. all of these
- x. The average of positive and negative peak values of voltage
 - a. is zero
 - b. is maximum
 - c. is minimum
 - d. is positive
- xi. The phase angle b/w the voltage and current A.C. through a resistor is
 - a. 0°
 - b. 45°
 - c. 180°
 - d. 270°
- xii. The impedance of circuit at resonance frequency is
 - a. minimum
 - b. maximum
 - c. one
 - d. zero
- xiii. The highest value reached by voltage or current in one cycle is called
 - a. peak to peak value
 - b. peak value
 - c. instantaneous value
 - d. rms value
- xiv. Electromagnetic waves consists of changing
 - a. electric field
 - b. magnetic field
 - c. changing electric and magnetic fields
 - d. no field is required
- xv. At high frequency, the current through a capacitor of A.C. circuit will be
 - a. large
 - b. small
 - c. infinite
 - d. zero
- xvi. The reactance provided by the inductor to the direct current is
 - a. zero
 - b. maximum
 - c. minimum
 - d. infinite
- xvii. During each cycle of alternating voltage, the voltage reaches its peak value
 - a. once
 - b. twice
 - c. thrice
 - d. four time
- xviii. When 10 V are applied to an A.C. circuit the current flowing in it is 100 mA, its impedance is
 - a. 50Ω
 - b. 75Ω
 - c. 90Ω
 - d. 100Ω
- xix. $10 \mu\text{F}$ capacitor is connected to an alternating voltage of 24 v and frequency 50 Hz. The reactance of the capacitor is,
 - a. 3.18Ω
 - b. 31.8Ω
 - c. 3.5Ω
 - d. 4.0Ω
- xx. In a resonance circuit of frequency 1000 kHz with an inductor of 5 mH, the capacitance will be
 - a. 10 pF
 - b. 8 pF
 - c. 5.1 pF
 - d. 3.1 pF

Question No. 2 Write short answers of any six.**2x6=12**

- i. Define impedance of the electrical circuit? Also give its mathematical form and unit.
- ii. What are the advantages of three phase A.C over single phase A.C.?
- iii. How does doubling the frequency affect the reactance of an inductor and a capacitor?
- iv. Explain the conditions under which electromagnetic waves are produced from a source?
- v. A sinusoidal current has rms value of 10 A. what is the maximum or peak value?
- vi. A choke coil placed in series with an electric lamp in an A.C. circuit causes the lamp to become dim. Why is it so? A variable capacitor added in series in this circuit may be adjusted until the lamp glows with normal brilliance. Explain, how this is possible?
- vii. A circuit contains an iron cored inductor, a switch and a D.C. source arranged in series. The switch is closed and after an interval reopened. Explain why a spark jumps across the switch terminals?
- viii. How many times per second will an incandescent lamp reach maximum brilliance when connected to a 50 hertz source?

Q. No. 3 a. Describe series resonance circuit (RLC series circuit) with the help of diagram. Also give its properties. **(5)****b.** A $100 \mu\text{F}$ capacitor is connected to an alternating voltage of 24 V and frequency 50 Hz. Calculate **a)** reactance of the capacitor **b)** current in the circuit. **(3)****OR****Q.No. 4 a.** Describe the RC series circuit with diagram. Also calculate its phase and impedance. **(5)****b.** At what frequency will an inductor of 1.0 H have reactance of 500 ohm? **(3)**