CHAPTER 16
(ALTERNATING CURRNT)
1. Encircle the correct answers.

i. If V_{rms} be the root mean square value of emf then its peak to peak value is given by:

a) $\dfrac{V_{rms}}{\sqrt{2}}$

b) $\sqrt{2}V_{rms}$

c) $\dfrac{2}{\sqrt{2}V_{rms}}$

d) $\dfrac{V_{rms}}{2}$

ii. The value of capacitive reactance is given by:

a) $X_c = VI$

b) $X_c = \dfrac{V}{I}$

c) $X_c = \dfrac{I}{V}$

d) All of above

iii. In case of capacitor, the unit of reactance is:

a) Farad
b) Ohm
c) Newton
d) All of these

iv. The unit of impedance is:

a) Farad
b) Henry
c) Tesla
d) Ohm

v. The natural frequency of L.C circuit is equal to:

a) $\dfrac{1}{2\pi}\sqrt{\dfrac{C}{L}}$

b) $\dfrac{1}{2\pi}\sqrt{\dfrac{L}{C}}$

c) $\dfrac{1}{2\pi\sqrt{LC}}$

d) $\dfrac{\sqrt{LC}}{2\pi}$

vi. The reactance of inductor depends upon:

a) L
b) ωL
c) ω
d) All of the above

vii. The effective value of any sinusoidal alternating current or voltage is:

a) $\sqrt{3}$ times its maximum value

b) $\dfrac{1}{\sqrt{2}}$ time its maximum value

c) $\sqrt{2}$ times its maximum value

d) None of the above

viii. At high frequency, the current through a capacitor is:

a) Small
b) Infinity
c) Zero
d) Large

ix. Radio frequency choke is:

a) Iron cored
b) Air cored
c) Air as well as iron cored
d) None of these

x. In frequency modulation, the amplitude of carrier waves is:

a) Increases
b) Remains constant
c) Decreases
d) None of these

Q.2 Write the short answers.

i. A sinusoidal current has rms(effective) value of 10 A. What is the maximum or peak value?

ii. Name the device that will (a) permit flow of direct current but oppose the flow of alternating current (b) permit flow of alternating current but not the direct current.

iii. How many times per second will an incandescent lamp reach maximum brilliance when connected to a 50 Hz source?

iv. 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 umps across the switch contacts?

v. How does doubling the frequency affect the reactance of (a) an inductor (b) a capacitor?

vi. Explain the conditions under which electromagnetic waves are produced from a source?

vii. How the reception of a particular radio station is selected on our radio set?

viii. Define choke and give its uses.

Note: Long questions:

Q.3 **(a)** What is series resonance circuit? Describe its properties. Also find the resonance frequency for the circuit.

(b) An alternating current is represented by the equation I = 20 sin 100 πt .Compute its frequency and the maximum and rms values of current.

Q.4 **(a)** Explain R-c series circuit. Find its impedance and also fine its phase.

(b) What is the resonant frequency of a circuit which includes a coil of inductance 2.5 H and a capacitance 40 μF?