

BHARATI VIDYAPEETH INSTITUTE OF TECHNOLOGY

Unit Test-I Question Bank

ECN-K Scheme (312332)

UNIT 1 Single Phase AC Series Circuits (16 M)

2 M Questions

1. Draw impedance triangle for R-L series circuit. Write nature of power factor of this circuit.
2. Define impedance and reactance related to single phase AC series circuit. Give the units of both.
3. Define Quality factor of series A.C. circuit.
4. Draw power triangle for R-C series circuit. State the nature of power factor of this circuit.
5. Define active power and reactive power for RLC series circuit.
6. Define RMS value and average value related to sinusoidal AC waveform.
7. Define impedance and state its unit.
8. Define power factor and state its value for pure resistance.
9. Convert $Z = 8 + j6 \Omega$ in polar form and $Z = 250 \angle 60$ in rectangular form

4 M Questions

1. Draw a circuit diagram of R.C. series circuit. Draw impedance triangle and power triangle for same circuit.
2. Derive the expression for resonance frequency for a RLC series circuit.
3. With neat diagram, explain the phasor representation of sinusoidal quantity.
4. For series R-L-C circuit, draw neat circuit diagram. State the conditions for RLC series ckt. Draw phasor diagram and voltage triangle impedance triangle for any 1 condition.
5. For a pure inductor connected across AC supply –
 - i) Write current equation.
 - ii) Draw voltage and current waveform.
 - iii) Draw phasor diagram.
 - iv) State value of power consumed.
6. A series R-L-C circuit consists of $R = 15 \Omega$, $L = 0.5 \text{ H}$ and $C = 25 \mu\text{F}$. If the circuit is supplied from 230V, 50 Hz AC supply, determine:

- (i) Circuit power factor (ii) Active power (iii) Reactive power (iv) Apparent power
7. An inductive coil having resistance of 5Ω and inductance of 0.2 H is connected in series with a capacitor of $20\mu\text{F}$. If this combination is connected to 230 V , variable frequency supply, determine:
 - (i) Resonant frequency (ii) Quality factor (iii) Current at resonance (iv) Voltage across inductive coil at resonance.
 8. Explain the Generation of single phase ac supply by an elementary alternator with neat diagrams.
 9. A resistance of 100Ω and $50\mu\text{F}$ capacitor are connected in series across a 230V , 50Hz supply. Find: i) Impedance ii) Current flowing iii) Voltage across resistance and capacitance iv) Power factor and power

UNIT 2 Single Phase AC Parallel Circuits (12 M)

2 M Questions

1. Define Susceptance and Admittance for parallel circuit.
2. Define Conductance. State its unit.
3. Define quality factor for parallel resonance and write its mathematical expression.
4. Define Bandwidth and Resonant frequency. Write its Formula

4 M Questions

1. Compare series resonance and parallel resonance on any four points.
2. A coil having resistance of 5Ω and an inductance of 0.2 H is connected in parallel with a series combination of 10Ω resistor and $80\mu\text{F}$ capacitor. If supply voltage is 230 V , 50 Hz , determine:
 - 1) Total circuit impedance
 - 2) Total current taken by the circuit
 - 3) Power factor of the circuit
 - 4) Branch currents
 - 5) Power consumed by the circuit.
3. An AC circuit consist of two branches in parallel.

Branch I: $R = 10\Omega$ and $L = 0.1\text{ H}$ in series

Branch II: $C = 50\mu\text{F}$.

If the circuit is supplied from 200V , 50Hz supply, determine:

 - (i) Branch impedances.
 - (ii) Branch currents
 - (iii) Circuit power factor
 - (iv) Power consumed by the circuit.
4. Two parallel impedances $Z_1 = (10 + j8)\Omega$ and $Z_2 = (15 - j10)\Omega$ are connected to 230V , 50 Hz AC supply. Using admittance method, calculate branch currents, total current and power factor of whole circuit.

UNIT 3 Three phase circuits (06 M)

2 M Questions

1. Draw the sinusoidal waveform of 3-phase emf and also indicate the phase sequence.
2. Give four advantages of poly-phase circuits over 1-phase circuits.
3. Define line voltage and phase voltage.
4. Define - Phase sequence and write equations for instantaneous values of 3ϕ voltages.
5. Define Balanced and Unbalanced load in case of Polyphase systems.

4 M Questions

6. Derive relation between line and phase voltages of star connection of 3ph load.
7. Explain 'Neutral Shift' in case of 3-phase star - connected unbalanced load.
8. Compare star & delta connection. (any four points)