

Assignments – Course Outcome matrix

Course Outcomes (COs):

CO-1 : Apply fundamental electrical laws and circuit theorems to electrical circuits.

CO-2 : Analyze single phase and three phase AC circuits.

CO-3 : Describe operating principle and applications of static and rotating electrical machines.

CO-4 : Understand the LT switchgear, earthing and safety of electrical appliances.

CO-5 : Comprehend illumination system, batteries, electrical consumption & billing and electrical measuring instruments.

Sr. No	Assignment	CO1	CO2	CO3	CO4	CO5
1.	Assignment-1	√				
2.	Assignment-2		√			
3.	Assignment-3			√		
4.	Assignment-4				√	
5.	Assignment-5					√

Assignment : 2

1. Define following terms
(i) Cycle, (ii) Time period, (iii) Frequency, (iv) RMS Value, (v) Average value, (vi) Peak factor, (vii) Form factor, (viii) Line Voltage/Current, (ix) Active power. (x) Power factor.
2. Explain AC circuit containing pure inductance with phasor diagram.
3. Analyze series RL circuit with phasor diagram and equation.
4. Explain series RLC circuit and obtain expression for impedance.
5. What is resonance in AC circuits? Explain its significance.
6. Explain parallel resonance and its characteristics.
7. Derive voltage and current relation in star and delta connection.
8. Explain two-wattmeter method of power measurement.
9. An alternating voltage is given by $v=325\sin(314t)$ Determine: (a) Peak value (b) RMS value (c) Frequency (d) Time period
10. Two voltages are given as: $V_1=100\angle 0^\circ\text{V}$ and $V_2=80\angle 30^\circ\text{V}$. Find the resultant voltage using phasor method.
11. A single-phase load takes 10 A current from 230 V supply at a power factor of 0.8 lagging. Calculate: (a) Active power, (b) Reactive power, (c) Apparent power
12. A resistor of $20\ \Omega$ is connected to 230 V, 50 Hz AC supply. Find the current and power consumed.
13. An RL series circuit has $R = 10\ \Omega$ and $L = 0.1\ \text{H}$. If supply voltage is 230 V at 50 Hz, find current and power factor.
14. In a parallel RC circuit, $R = 40\ \Omega$ and $C = 100\ \mu\text{F}$. Find line current and phase angle.
15. A R-C series circuit having Resistance $R = 5.77\ \Omega$ and reactance $X_C = 3.33\ \Omega$ is connected across 230 V, 50 Hz ac supply. Find (a) current (b) Power factor (c) Average power.
16. In a series-parallel circuit, the parallel branches A and B are in series with branch C. The impedances are: $Z_A=(4+j3)\ \Omega$, $Z_B=(4-j3)16)\ \Omega$, $Z_C=(2+j8)\ \Omega$, If the current $I_C=(25+j0)\ \text{Amp}$, Determine the branch currents and voltages and the total voltage. Hence calculate the complex power for each branch and the whole circuit.
17. A series RLC circuit consists of a resistance of $500\ \Omega$, inductance of $50\ \text{mH}$ and a capacitance of $20\ \text{pF}$. Find: (i) The resonant frequency, (ii)The Q factor of the circuit of resonance, (iii) The half power frequency
18. A balanced star connected load of $(8 + j6)\ \Omega$ per phase is connected to a 415 V, 50 Hz, 3- ϕ supply. Find the line current, power factor, power and total volt-amps.
19. A 3- ϕ load consists of three similar inductive coils, having resistance $50\ \Omega$ and inductance $0.2\ \text{H}$. If supply voltage is 415 V, 50 Hz, calculate: (i) the line current (ii) power factor (iii) total power consumed when load is connected in star and delta.
20. For 415 V, three phase system, power was measured by two wattmeters and readings were 10.5 kW and $-2.5\ \text{kW}$. Calculate (i) power factor (ii) Line current.

Rubric wise marks obtained:

Criteria	Level of Knowledge and Understanding	Analytical Ability	Quality & Correctness of Write-up, Ethical Practices and Submission	Total
Marks				