

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. Derive the current and voltage relation in a purely resistive AC circuit.
2. Explain AC circuit containing pure capacitance with phasor diagram.
3. Analyze series RC circuit with phasor diagram.
4. Explain parallel RLC circuit with phasor diagram.
5. Explain series resonance and derive resonant frequency.
6. Explain advantages of three-phase system over single-phase system.
7. Explain power measurement in three-phase balanced circuits.
8. Derive expression for total power in a three-phase balanced system.
9. A sinusoidal current has peak value of 15 A. Find: (a) RMS value (b) Average value (c) Form factor (d) Peak factor
10. A current of 10 A leads the voltage by 30° , Represent the voltage and current phasors.
11. A load absorbs 4 kW at a power factor of 0.6 lagging. Find the apparent power and reactive power.
12. A pure inductance of 0.2 H and a capacitor of 50 μF is connected to 230 V, 50 Hz supply. Calculate reactance of the circuit and current.
13. In a series RC circuit, $R = 20 \Omega$ and $C = 100 \mu\text{F}$. Find impedance, current and phase angle.
14. A resistor of 40Ω and an inductor of 0.2 H and capacitor of $120 \mu\text{F}$ are connected in parallel across 230 V, 50 Hz supply. Find (1) the current of each branch (2) the resultant current (3) Power factor of the circuit
15. A circuit consumes a power of 1000 W at 0.6 leading power factor, when connected to 200 V, 50 Hz ac supply. Calculate (a) Current (b) Apparent power (c) Reactive power.
16. Two impedances are connected in parallel across a 100 volt, 50 Hz a.c. supply. Impedance no. 1 has resistance of 8Ω and capacitive reactance of 7Ω . While impedance no. 2 has resistance of 5Ω and inductive reactance of 6Ω . Calculate: (i) Current through each circuit & p.f. of each circuit. (ii) Total current and p.f. of combined circuit. (iii) Power taken by the whole circuit.
17. A resistance of 1Ω and inductance of 0.02 H are connected in series with a capacitor across 200 V supply. Find the value of capacitance, so that current drawn by circuit will be maximum at frequency 50 Hz. Find current and voltage across capacitor.
18. For 3- ϕ star connected load consists of non-inductive resistance of 50Ω in parallel with a capacitance of 15 μF . Calculate the line current, power absorbed, total kVA and power factor when connected to 415 V, 3-phase, 50 Hz supply.
19. In balanced 3- ϕ , 415 V system, line current is 100 A. When power is measured by two wattmeters, one wattmeter indicates power and other indicates zero. What will be power factor of load & measured power? If the power factor were unity and same load current what would be the reading of each wattmeter?

Rubric wise marks obtained:

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