**Department of Electronics & Communication Engineering**

(Faculty of Technology, Dharmsinh Desai University, Nadiad)

**Academic Year: 2022 - 2023**

**TUTORIAL – 7**

**Subject:***(ESC101) BASIC ELECTRICAL ENGINEERING*

**Class :**  *B. Tech. Sem.I (EC/CE/IT)*

**Topics:** *Three-phase balanced circuits, voltage and current relations in star and delta connections Pharos representation, real power, reactive power, apparent power, power factor.*

1. A resistance of 20 Ω, an inductance of 0.2 H and a capacitance of 100μF areconnected in series across 220-V, 50-Hz mains. Determine the following (a) impedance (b) current(c) voltage across R, L and C (d) power in watts and VA (e) PF and angle of lag.
2. A pure inductor, a non-inductive resistor and a capacitor are connected inseries. The supply emf is 85 V at 50 Hz, the PD across the inductor is 40 V and the PD across the resistor and capacitor together is 85 V. The current is5 A. Calculate the values of all components and power factor of circuit.
3. A circuit is made of two branches in parallel, one having a resistance of 10Ω, in series with an inductive reactance of 20 Ω, the other having aresistance of 15 Ω in series with a capacitive reactance of 15 Ω. Thesupply voltage is 200 V. Find the total current, power and power factor.
4. A series RLC circuit has R = 5 Ω, L = 0.01 H, C = 10 mF, calculate theresonant frequency, Q factor and bandwidth.
5. A balanced star connected load of (5 + j7) Ω impedance is connected to 400 V, three phase supply. What is the real power consumed by the load?
6. A balanced star connected load of (4 – j5) Ω impedance is connected to 400-V, 50 Hz, 3-phase supply. What is the power consumed in the load? At what power factor, is that power consumed?

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