ASSIGNMENT three phase AC

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1. A 3-phase balanced load connected across a 3-Φ, 400 V ac supply draws a line current of 10 S. Two wattmeters are used to measure input power. The ratio of two wattmeter readings is 2:1. Find the readings of the two wattmeters.
2. A balanced star-connected inductive load is connected to a 400 V, 50 Hz ac supply. Two wattmeters used to measure supply power indicate 8,000 W and 4,000 W respectively. Determine :

(i) Line current (ii) impedance of each phase (iii) resistance and inductance of each phase.

1. Show that power in 3-phase, balanced system is constant at every instant and is given by 3 VpIp cosΦ, where Vp, Ip and Φ have usual meanings.
2. Derive the relationship between line current, phase current, line voltage and phase voltage in a 3-phase star-connected and delta-connected circuit.
3. A star- connected load has impedance of (6 + j8) Ω in each phase and is connected across a balanced 400 V, 3-phase supply. Obtain the line currents, total real power and reactive power consumed by the load.
4. Define phase sequence in a 3-phase system.

Three 100 Ω resistors are connected in (a) star and (b) delta across 440 V, 50 Hz, 3-phase lines: Calculate the line currents and phase currents and power taken from supply mains in each case.

1. In the two- wattmeter method of power measurement in a three-phase, the readings of the wattmeter are 1,000 W and 550 W. What is the power factor of the load?
2. The power readings of two wattmeters are + 15 kW and -4 kW for a 3-phase balanced load. If the supply voltage is balanced 440 V, find the true power drawn by the load, the power factor and line current.
3. Three identical coils, each having a reactance of 20 Ω and resistance of 20 Ω are connected in (a) star (b) delta across a 440 V, 3-phase line. Calculate for each method of connection the line current and readings on each of two wattmeters connected to measure the power.
4. Three equal impedances, each consisting of R and L in series are connected in star and are supplied from a 400 volts, 50

Hz, 3-phase, 3-wire balanced supply system. The power input to the load is measured by 2-wattmeter method and the two wattmeters read 3 kW and 1kW. Determine the value of R and L connected in each phase.

1. A star-connected three –phase load has a resistance of 8 Ω and has an inductive reactance of 6 Ω in each phase. It is fed

from a 400 V, 3-phase balanced supply. Determine the line current, power factor, active and reactive powers. Draw phasor diagram showing phase and line voltages and currents. If power measurement is made using two-wattmeter method, what will be the readings of both wattmeters?

1. Three identical impedances of 30 ∠30° ohms are connected in delta to a 3- phase, 3-wire, 208 V abc system by conductors which have impedances of (0.8 + j0.6) ohm. Find the magnitude of the voltage at the load end.
2. Three similar coils each having a resistance of 8 ohm and an inductance of 0.0191 H in series in each phase is connected

across a 400 V, three phase, 50 Hz supply. Calculate the line current, power input, kVA and kVAR taken by the load.

1. Each phase of a delta-connected load has a resistance of 25 Ω, an impedance of 0.15 H and a capacitance of 120 μF in

series. The load is connected across a 400 V, 3-phase supply. Determine the line current, active power and reactive volt-amperes.

1. A balanced 3-phase star-connected load of 18 kW taking a leading current of 60 amperes when connected across a 3-phase 440 V, 50 Hz supply. Find the values and nature of the load.
2. A balanced star-connected load of (8 + j6) Ω per phase is connected to a 3-phase,230 V, 50 Hz supply. Find the line current, pf power, volt-amperes and reactive power. Draw the phasor diagram for the above circuit.