Department of Electrical Engineering

1. Three loads, each of resistance 30 ohm, are connected in star to a 415 V, 3-phase supply. Determine (a) the system phase voltage, (b) the phase current and (c) the line current.
   [Ans: 240 V, 8 A, 8 A]

2. A star-connected load consists of three identical coils each of resistance 30Ω and inductance 127.3 mH. If the line current is 5.08 A, calculate the line voltage if the supply frequency is 50 Hz.
   [Ans: 440 V]

3. Three identical coils each of resistance 30Ω and inductance 127.3 mH are connected in delta to a 440 V, 50 Hz, 3-phase supply. Determine (a) the phase current, and (b) the line current.
   [Ans: 8.8 A, 15.24 A]

4. A balanced star-connected load of $(4 + j3)$Ω per phase is connected to a 3-phase, 415 V, 50 Hz supply. Find (a) line current (b) the power factor (c) the power (b) the reactive volt-amperes and (e) the total voltamperes.
   [Ans: 47.92A; 0.8 lagging; 27.56 kW; 20.67 kVAR; 34.4kVA]

5. Three identical coils, each of resistance 10Ω and inductance 42 mH are connected (a) in star and (b) in delta to a 415 V, 50 Hz, 3-phase supply. Determine the total power dissipated in each case.
   [Ans: 6.3 kW, 18.87 kW]

6. Each arm of delta connected load has a resistance of 25Ω , an inductance of 0.15 H, and a capacitance of 120μF in series. The load is connected across a 400 V, 50 Hz, 3-phase supply. Determine the line current, active power and reactive volt-amperes.
   [Ans: 21.38 A, 11.43 kW, 9.42 kVAR]

7. Three similar resistors connected in star draw a line current of 5 A from 400 V, 3-phase mains. To what value should the line voltage be changed to obtain the same line current with resistors connected in delta?
   [Ans: 133.33 V]