

3. b) Show that the current through purely capacitive circuit leads the applied voltage by 90° and average power consumed is zero. Draw the wave shapes of current, voltage and power. [06 Marks] CO2 L3
3. c) A pure resistance of 50 ohms is in series with a pure capacitance of 100 microfarads. The series combination is connected across 100-V, 50-Hz supply. Find (a) the impedance (b) current (c) power factor (d) voltage across resistor [08 Marks] CO2 L3

OR

4. a) With the help of circuit diagram and phasor diagram, find the phase angle, impedance and power in case of R-C series circuit. [08 Marks] CO2 L3
4. b) Three coils having resistance of 10Ω and inductance of 0.02H are connected in star across 440V, 50Hz three phase supply. Calculate the line current, power factor and total power consumed. [06 Marks] CO2 L3
4. c) An expression for alternating voltage is given by $V=140\sin 314t$. Find (i) RMS value, (ii) average value, (iii) Form factor [06 Marks] CO2 L3

Module-3

5. a) Derive the emf equation of a transformer and hence obtain the voltage and current transformation ratios. [06 Marks] CO3 L3
5. b) With a neat circuit diagram and phasor diagram, prove that two wattmeters are sufficient to measure 3ϕ power. [08 Marks] CO2 L2
5. c) A three phase load of three equal impedances connected in delta across balanced 440V, 50Hz supply, takes a current of 10 A at 0.7 lagging power factor. Calculate (i) The phase current (ii) Total power (iii) Total VAR [08 Marks] CO2 L3

OR

6. a) Obtain the relationship between line and phase values of voltage and current in a balanced 3 phase delta connected system. [06 Marks] CO2 L3
6. b) Explain the various losses in a transformer and how to minimize them? [06 Marks] CO3 L2
6. c) A transformer is rated at 100 kVA. At full load its copper loss is 1200W and its iron loss is 960W. Calculate: i) the efficiency at full load, UPF ii) the efficiency at half load, 0.8 p.f. [08 Marks] CO3 L3

Module-4

7. a) With a neat diagram explain the construction of 3-Phase Induction Motor [06 Marks] CO3 L2
7. b) Derive the Torque Equation of DC Motor. [06 Marks] CO3 L2
7. c) An 8 pole 3 phase alternator runs at 750RPM and supplies power to 6 pole 3 phase induction motor which runs at 970 RPM. What is the slip of the induction motor? [08 Marks] CO3 L3

OR

8. a) Explain the concept of Rotating Magnetic Field in a 3-Phase Induction motor with neat vector diagrams. [07 Marks] CO3 L2
8. b) Explain the significance of Back EMF in DC Motor. [06 Marks] CO3 L2
8. c) A 200V, 4 Pole, lap wound DC shunt motor has 800 conductors on its armature. The resistance of the armature winding is 0.5Ω and that of the [07 Marks] CO3 L3

shunt field winding is 200Ω . The motor takes 21A and flux /pole is 30mWb. Find speed and gross torque developed in the motor.

Module-5

9. a) With neat circuit diagram and switching table explain two way and three way control of load [06 Marks] CO4 L2
9. b) What is electric shock? Give the list of preventive measures against the shock. [06 Marks] CO4 L2

In a 4BHK flat, total 8persons are residing. The average consumption of electricity per day for this flat is as follows:

No	Appliance(s)	Wattage	Hours
1	4 Geysers	1.5kW	15min
2	4 Air conditioners	1.8kW	1hour
3	1 refrigerator	450W	3hours
4	1 induction heater	1500W	30 min
5	8 LED tube lights	20W	6hours
6	8 ceiling fans	100W	2hours

[08 Marks] CO4 L3

If the tariff of electric supply company is as follows, estimate the total electricity bill for this flat for the month of March. i)Up to 100 units :Rs 4.00 per unit ii)From 101 to 200 units :Rs 5.00 per unit iii)From 200 to 400 units :Rs.6.50 per unit iv)Above 400 units :Rs.8.00 per unit

OR

10. a) What are the desirable characteristics of tariff and explain two part tariff. [04 Marks] CO4 L2
10. b) What is earthing? Why earthing is required? With the help of sketch explain plate earthing. [10 Marks] CO4 L2
10. c) A consumer has the following connected load: 10 lamps of 80W each and two heaters of 1500W each. His maximum demand is 1500 W. On the average, he uses 8 lamps for 5 hours a day and each heater for 3 hours a day. Each unit is 4 INR. Find his total load, monthly energy consumption and amount of bill. [06 Marks] CO4 L3
