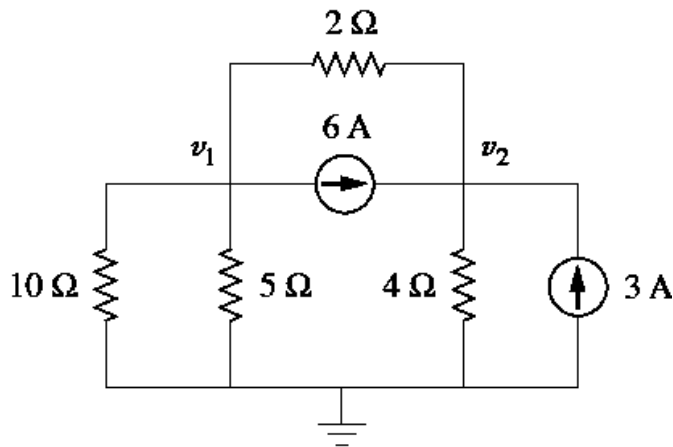


UNIT-1

- 1) Explain the KCL and KVL.
- 2) A circuit of three resistors 15Ω , 21Ω and 39Ω respectively joined in parallel is connected in series with fourth resistance. The whole circuit is applied with $60V$ and is found that the power dissipated in the 15Ω resistor is $36W$. Determine the value of the fourth resistance and the total power dissipated in the circuit.
- 3) Derive the relation between line and phase quantities of voltages and current for a star connected system?
- 4) Define the R.M.S value and average value of an alternating quantity
- 5) For the circuit in Figure 1, obtain v_1 and v_2



- 6) A three-phase balanced delta connected load of $(9+j2)$ ohm is connected across a $400V, 3\phi$ balanced supply. Determine the phase currents and line currents. Assume the phase of sequence to be RYB. Also calculate the power drawn by load
- 7) An alternating current is represented by $I = 70.7 \sin 520t$. Determine (i) the frequency (ii) the current 0.0015 second after passing through zero, increasing positively.
- 8) Given a balanced $3-\phi, 3$ -wire system with Y-connected load for which line voltage is $230 V$ and impedance of each phase is $(6 + j8)$ ohm. Find the line current and power absorbed by each phase.
- 9) Mention about the phasor representation and distinguish between real and reactive power.

UNIT-2

- 1) What are the types of wires and cables? Explain
- 2) What are the important characteristics of batteries.
- 3) Explain the need of power factor improvement.
- 4) With a neat diagram explain about the different parts, operation and applications of the following circuit breakers:
 - a) Miniature circuit breakers (MCB)
 - b) Earth leakage circuit breakers (ELCB)
- 5) Explain in detail about the important characteristics for Batteries.
 - c) Describe the pipe earthing used in electrical installations with a neat diagram.
4. What are the applications of MCCB? Explain the working principle of MCCB.
5. Give the construction and the working of a lead acid storage battery.
6. What is the necessity of earthing the electrical equipment? Give a cross-sectional view of the earthing arrangement.
7. List out the advantages of power factor improvement in electrical systems. Explain how Synchronous Condenser can be used to improve the power factor.
8. Discuss the operational usage of switch fuse unit (SFU), MCB, ELCB and MCCB in different applications with the limitations.
9. Discuss about the different components of LT switchgear and their protection advantages.
10. Explain the types of Batteries with their characteristics and write about the battery backups

UNIT-3

- 1) Describe the working principle of a single-phase transformer.
- 2) A 4-pole, 300 V d.c. shunt generator has 720 wave-connected conductors in its armature. The full load current is 50 A and the flux per pole is 0.02 Wb. The armature resistance is 0.3 ohms and the contact drop is 1 V per brush. Calculate the full load speed of the motor
- 4) Derive torque equation in a D.C motor.
- 5) A phase induction motor is wound for 4 poles and is supplied from 50 Hz systems. Calculate: i) the synchronous speed ii) the speed of the motor when slip is 4% and iii) the rotor current frequency when the motor runs at 600 r.p.m.
- 6) Describe how the speed of the dc motor can be controlled below rated speed.
- 7) A dc generator has an armature e.m.f of 100 V when the useful flux per pole is 20 mWb and the speed is 800 r.p.m. Calculate the generated e.m.f (i) with the same rated flux and a speed of 1000 r.p.m (ii) with a flux per pole of 25 mWb and a speed of 900 r.p.m.
- 7) What are the losses that occur in a transformer and how can these losses be reduced?
- 8) Draw and explain the torque-slip characteristics of an induction motor
- 9) Discuss with suitable diagrams different types of dc generators and their field of applications.
 - b) Explain the principle of working of transformer. Why the primary of transformer draws current from the mains when the secondary is open circuited?
- 10) Describe the constructional differences between a squirrel cage rotor and wound rotor of an induction motor. Discuss their relative advantages and disadvantages.

UNIT-4

- 1) Explain how a pn junction is formed and state its properties under no bias, forward bias and reverse bias condition.
- 2) Explain the operation of center tapped full wave rectifier with neat diagram.
- 3) With neat diagram explain the operation of p-n-p common emitter transistor.
- 4) Compare CB, CE and CC configurations of BJT.
- 5) Explain the VI characteristics of PN Junction diode with neat diagram and explain. What is Static Resistance and Dynamic Resistance?
- 6) Draw the circuits of a full wave rectifier using 4-diodes. Discuss the relative merits and demerits. Draw the circuits of a full wave rectifier using 2-diodes and 4-diodes. Discuss the relative merits and demerits.
- 7) Describe the pnp transistor in common Emitter configuration. How the transistor is used as an amplifier. Discuss the operation and working principle of synchronous generators in brief.
- 8) Explain the energy band diagram of p-n junction diode for no bias, under forward bias and in reverse biased condition.
- 9) Discuss the operation of half wave and full wave rectifiers with and without capacitor filter.
- 10) Describe the diode currents and their equations and discuss the effect of temperature on diode current.

1) UNIT-5

- 1) Discuss the characteristic differences between a BJT and a FET. Draw a diagram depicting the structure of a N-channel FET and identify the various terminals and the biasing voltages.
- 2) Explain how the pinch off voltage can be modified without changing the physical structure of a JFET.
- 3) What is Early effect? Explain how it affects the BJT characteristics in CB configuration.
- 4) What is meant by depletion region in JFET? Explain with suitable diagrams what are the basic differences between BJT and JFET?
- 5) Differentiate between NPN and PNP transistor construction and operation and discuss the input and output characteristics of the transistor in CE, CB and CC configurations.
- 6) Explain the process of JFET construction and operation and how this is different from BJT.
 - a. Mention about the FET biasing and methods of biasing with their merit