

OCTOBER 2021

Time: Three hours

Maximum Marks: 75

- Note:
1. Answer ALL the questions in PART-A (1 mark each)
  2. Answer any ONE question from each unit in PART-B (3 marks each)
  3. Answer any ONE question from each unit in PART-C (10 marks each)
  4. The question paper contains TWO Pages

**PART-A** (1x10=10)

1. State kirchoff's first law.
2. Define capacitance.
3. Give the current equivalent of voltage source.
4. State superposition theorem.
5. Define peak factor.
6. Convert  $6+j8$  into polar form.
7. Write any one point of application of lead acid battery.
8. Define dynamic resistance.
9. In two wattmeter method of  $3\phi$  load, when the P.F. is zero.
10. Define three phase system.

**PART-B** (3x5=15)

UNIT-I

11. A circuit is made of  $0.4\Omega$  wire, a  $150\Omega$  bulb and  $120\Omega$  rheostat connected in series. Determine the total resistance of the circuit.
12. A charge of 10 micro coulomb is placed 100 cm away from a charge of 50 micro coulomb in a medium of relative permittivity 4.5. Calculate the force between them.

UNIT-II

13. Give the step by step procedure of obtaining Norton's two terminal network.
14. Calculate the star equivalent of delta resistors of 5, 6 and 8 ohms.

UNIT-III

15. Define 1) Cycle 2) Frequency 3) Time period.
16. A coil take 3KVA and 1.2 KVAR when connected to a 240V 50 Hz supply. Calculate the power dissipated and current.

UNIT-IV

17. What are the effects of series resonance?
18. List out any three points of maintenance of lead acid battery.

UNIT-V

19. Draw the waveform of three phase sequence.
20. The power input to a 3 phase induction motor is read by two watt meters. The readings are 860W and 240W. What is the input power and power factor of the motor?

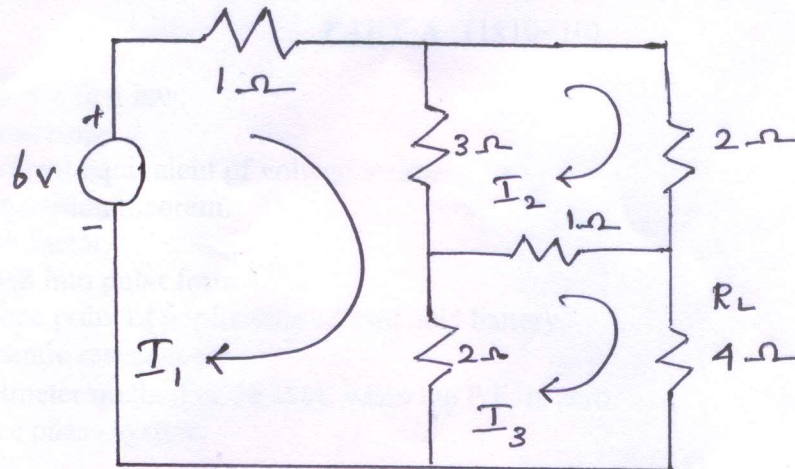
PART-C (10x5=50)

## UNIT-I

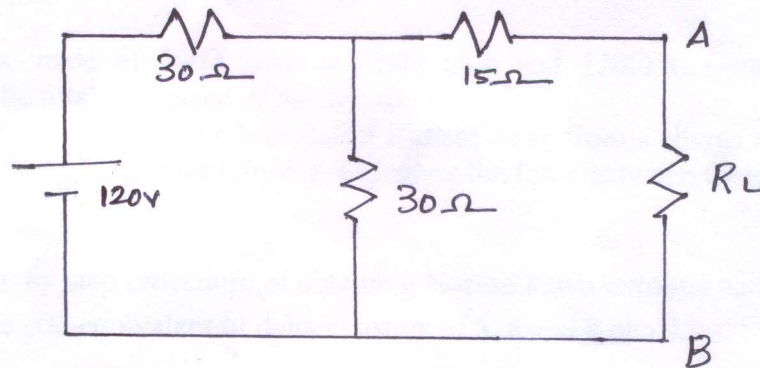
21. Three resistors of 3, 4 and 5 ohms respectively are connected in parallel across the voltage source of 120V, 50 Hz supply. Find the equivalent resistance, total current and power dissipated in each resistor.
22. Derive an expression for three capacitors are connected in series and parallel.

## UNIT-II

23. Determine the current flow through the 4Ω load resistance as shown in figure.



24. Calculate the value of load resistance for maximum power transferred from the given circuit.



## UNIT-III

25. A resistance of 3Ω, inductive reactance of 8Ω and a capacitive reactance of 4Ω are connected in series across the a.c voltage of 200V is applied. Find the impedance, Current, Power factor, Power and p.d across  $X_L$ .
26. Two impedance  $Z_1 = (10 + j5)$  and  $Z_2 = (8 + j6)$  are connected in parallel across a voltage of 200V. Find the total current taken and also the power factor of the circuit.

## UNIT-IV

27. In a RLC series resonance circuit  $R = 10\Omega$ ,  $L = 20\text{mH}$  and  $C = 0.5\ \mu\text{F}$ . Find the resonant frequency, Quality factor, half power frequencies and bandwidth. If applied voltage to a circuit is 200V.
28. Discuss the chemical actions taking place in a lead acid battery during charging and discharging.

## UNIT-V

29. A balanced star connected load of impedance  $(15 + j20)$  ohm per phase is connected to a 3 phase 440V, 50Hz supply. Find the line currents and power absorbed by the load.
30. The power input to a 400 volt, 50Hz, 3 phase motor is measured by two wattmeters which indicates 300KW and 100KW respectively. Calculate the input power, power factor and line current.