

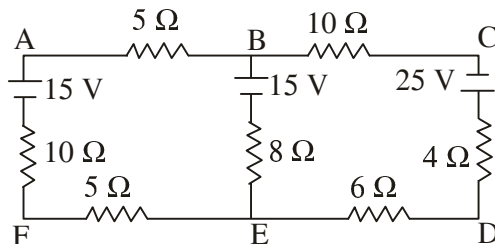
Time : Three Hours]

[Maximum Marks : 75

**Note :** Attempt *five* questions in all, selecting at least *one* question from each unit.

**UNIT-I**

1. (a) Explain Loop current method with example in detail. 5
  - (b) Explain Superposition and Maximum power transfer theorem in brief. 5
  - (c) Three resistors 12 ohm, 18 ohm and 36 ohm are connected in parallel. This parallel circuit is connected in series with a resistor 'R'. The whole circuit is connected to supply of 60 volt and it is found that power developed in 12 ohm resistor is 48 watts. Determine the value of R and total power. 5
2. Find both the Norton's and Thevenin's equivalent circuits w.r.t. the load resistor of 8 Ω in the network shown below : 15



## UNIT-II

3. (a) Two coils A and B are connected in series across a 240 V, 50 Hz supply. The resistance of A is 5 ohm and the inductance of B is 0.015 H. If the input from the supply is 3 kW and 2 kVAR, find the inductance of A and resistance of B. 5
- (b) Derive the resonant frequency of a standard parallel circuit (C paralleled with RL). 5
- (c) Convert a delta connected set of unequal resistors into star. 5
4. (a) Explain in detail the theory of sinusoidal frequency response of series RLC ckt. including condition of resonance. 10
- (b) What do you mean by Electric power? Explain its types. 5

## UNIT-III

5. (a) Establish relation between line voltage & phase voltage in a 3-phase star connected balanced power system. 5
- (b) Explain in detail the two-wattmeter method of power measurement for a star connected inductive load (RL series) for  $|\pi/6 > \theta|$  with suitable steps containing equations, ckt. & phasor diagram. And also explain the effect of power factor on two-wattmeter readings. 10

6. (a) Draw and explain equivalent circuit of a 1-phase transformer when primary parameters are referred to secondary side. Also write label (name/meaning) of each parameter. 5
- (b) Explain open and short circuit test on single phase transformer. 5
- (c) Explain the concept of auto transformer. 5

#### UNIT-IV

7. (a) Explain the working principle of Three phase Induction motor. 5
- (b) Derive the equation for back EMF developed in DC motor. 5
- (c) Explain different types of DC motors with circuit diagrams. 5
8. Write short notes on any *three* of the following :
- (a) Switch Fuse Unit.
- (b) Types of Cables.
- (c) Synchronous Motor.
- (d) MCCB. 15