11920

3 Hours / 70 Marks   Seat No.

Instructions : (1) All Questions are *compulsory.*

(2) Illustrate your answers with neat sketches wherever necessary.

(3) Figures to the right indicate full marks.

(4) Assume suitable data, if necessary.

Marks

SECTION – I

1. **Attempt any SIX of the following :**   **12**

(a) Define the terms :
  (i)   EMF
  (ii) Potential difference

(b) State the Faraday's law of electromagnetic induction.

(c) Define :
  (i)   Angular velocity
  (ii) Power factor

(d) Define transformation ratio of transformer & efficiency of transformer.

(e) Define RMS value & Average value with respect to sinusoidal AC waveform.

(f) Draw RL series circuit.

(g) State the types of FHP motor.

2. **Attempt any THREE of the following :**   **12**

(a) Draw & explain B-H curve.

(b) Explain the working of single phase AC motor.

(c) Draw & explain RLC series circuit.

(d) Explain the working principle of Auto-transformer.
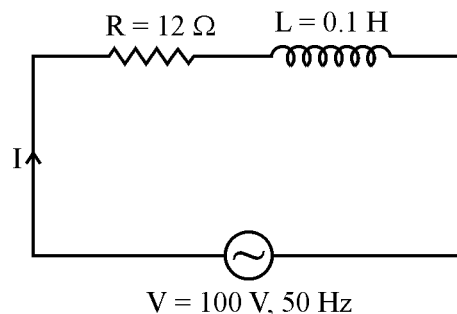
3. **Attempt any TWO of the following :** 12

(a) Derive the EMF equation of single phase transformer. State the losses in transformer.

(b) Define self-induced emf & mutually induced emf. Derive the equation of self inductance & mutual inductance.

(c) A coil having resistance of 12 Ω & an inductance of 0.1H is connected across a 100 V, 50 Hz supply; calculate :

(i) the reactance & impedance of coil

(ii) the current

R = 12 Ω   L = 0.1 H

I

V = 100 V, 50 Hz

SECTION – II

4. **Attempt any FIVE of the following :** 10

(a) Give examples of active component & passive component.

(b) State the configurations of BJT.

(c) Define efficiency & ripple factor of rectifier.

(d) Define α (alpha) and β (beta) of a transistor.

(e) Draw V-I characteristics of p-n junction diode & give rated value of cut-in-voltage for Si & Ge.

(f) State the need of filter in DC regulated power supply.

5. **Attempt any THREE of the following :** 12

   (a) Explain the construction & working of LED.

   (b) Compare Common Base (CB), Common Emitter (CE) & Common Collector (CC) configuration of BJT.

   (c) Explain voltage source & current source with diagram.

   (d) Draw the following signals & explain the parameters of each signal :
      (i) Sinusoidal
      (ii) Square

6. **Attempt any TWO of the following :** 12

   (a) Calculate value of resistor from the given colour codes :
      (i) Brown Black Red Gold
      (ii) Yellow Violet Orange Gold
      (iii) Red Red Orange Silver

   (b) Draw a circuit diagram of full wave centre tap rectifier with capacitor filter & explain the operation with waveforms.

   (c) Draw & explain transistor as an amplifier. State the effect of cascading on voltage gain & bandwidth.

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