

22208

21819

3 Hours / 70 Marks

Seat No.

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- Instructions :**
- (1) All Questions are *compulsory*.
 - (2) Answer each Section on separate answer sheet.
 - (3) Answer each next main Question on a new page.
 - (4) Illustrate your answers with neat sketches wherever necessary.
 - (5) Figures to the right indicate full marks.
 - (6) Assume suitable data, if necessary.

Marks

SECTION – I

1. Attempt any SIX of the following :

12

- (a) Compare between Electric and Magnetic circuit. (any 4 points)
- (b) Define the following terms :
 - (i) RMS value
 - (ii) Average value
 - (iii) Cycle
 - (iv) Frequency
- (c) State the working principle of single phase transformer.
- (d) Draw power triangle and show the quantities on it.

- (e) Differentiate statically and dynamically induced e.m.f.
- (f) Write the applications of autotransformer.
- (g) Write the applications of 1- ϕ motor.
- (h) State Len'z law.

2. Attempt any THREE of the following :

12

- (a) Describe B-H curve of the magnetic material.
- (b) State the voltage and current relationship in star and delta connection.
- (c) Explain the working principle of 1- ϕ induction motor.
- (d) In a series a.c. circuit consisting of 8Ω inductive reactance and $10\ \Omega$ resistance, a current of 6 ampere is flowing through the circuit.
 - (i) Find voltage across each parameter of circuit.
 - (ii) Calculate the phaser difference in degrees between the current and the voltage in the combination.
- (e) Select the motor for following applications :
 - (i) Table Fan
 - (ii) Spray pump
 - (iii) Blower
 - (iv) Fruit Juicer

3. Attempt any TWO of the following :

12

- (a) Write the Faraday's laws of electromagnetic induction and derive the equation for self induced emf and mutually induced emf.

- (b) A coil of resistance 4Ω and inductive reactance of $42\ \Omega$ is connected in parallel with a resistance $15\ \Omega$ and capacitive reactance $18\ \Omega$. When the voltage across the circuit is 220 V , find :
- the current taken by each branch
 - the total current taken from mains
 - the power factor of the circuits.
 - draw the vector diagram.
- (c) Derive an emf equation of single phase transformer.

SECTION – II

4. Attempt any FIVE of the following : 10

- List any four specifications of resistor.
- Compare between PN junction diode and zener diode.
- List the applications of transistor.
- Draw the circuit diagram of centre-tapped full wave rectifier.
- If a resistor has colour codes Brown Black Red Gold, find the value of resistor.
- State input impedance and output impedance for CB configuration of transistor.

5. Attempt any THREE of the following : 12

- Explain zener diode as voltage regulator.
- Differentiate between active and passive components.
- Describe the working of full wave bridge rectifier with LC filter. Draw input and output waveforms for it.
- Draw a sinusoidal waveform for $100 \sin 314t$ showing magnitude, time period T and Frequency.

P.T.O.

6. Attempt any TWO of the following :

12

- (a) Write the difference between ideal and practical voltage and ideal & practical current sources. State example of practical voltage and current source.
 - (b) Draw the experimental setup to plot V-I characteristics of PN junction diode and explain the V-I characteristics of PN junction diode.
 - (c) Define cut-off, active and saturation region and draw the output characteristics of CE configuration with different operating regions of transistor.
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