

22208

21222

3 Hours / 70 Marks

Seat No.

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15 minutes extra for each hour

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

SECTION-I

Marks

1. Attempt any SIX of the following :

12

- (a) State Len'z law.
- (b) Define :
 - (i) MMF
 - (ii) Reluctance
- (c) Draw circuit diagram and phasor diagram of an AC R-C series circuit.
- (d) Define :
 - (i) Form factor
 - (ii) Crest factor
- (e) State the working principle of transformer.
- (f) Give classification of single phase induction motor. (Any four)
- (g) List different types of transformer based on construction.

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

- (a) Draw a neat diagram of any one type of single phase AC motor. Write about its construction.
- (b) State the principle of 3ϕ emf generation and sketch three phase voltage waveform.
- (c) Draw star connected 3ϕ load and show line voltage and phase voltage on it. Also write the relation between line and phase value of voltage and current.
- (d) Explain voltage ratio, current ratio and transformation ratio of transformer with neat sketch.

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

- (a) Compare Dynamically induced emf and statically induced emf on basis of
 - (i) Movement of coil or magnet
 - (ii) Current through electromagnet
 - (iii) Expression for induced voltage
 - (iv) Application
 - (v) Diagram
- (b) A circuit has resistance of $100\ \Omega$ and an inductance of $0.5\ \text{H}$. It is connected to $230\ \text{V}$, $50\ \text{Hz}$ ac supply. Calculate
 - (i) Inductive reactance
 - (ii) Impedence
 - (iii) Current
 - (iv) Power factor
 - (v) Voltage across individual element
 - (vi) Active power
- (c) Explain working principle of Autotransformer with suitable diagram. State its two application.

SECTION-II

- 4. Attempt any FIVE of the following : 10**
- (a) List out two active and two passive components.
 - (b) Give colour code for following resistor :
 - (i) $100\ \Omega$, 10%
 - (ii) $47\ \text{k}\Omega$, 5%
 - (c) Define Ripple factor and efficiency for a rectifier.
 - (d) Give any four applications of BJT.
 - (e) Draw the input and output waveforms of halfwave rectifier.
 - (f) Write any two specifications of a capacitor.
- 5. Attempt any THREE of the following : 12**
- (a) Compare Analog IC's and digital IC's on any four points.
 - (b) Explain working of Zener diode and draw its VI characteristic.
 - (c) Draw circuit diagram of π filter and explain its working.
 - (d) Explain working of a transistor as switch.
- 6. Attempt any TWO of the following : 12**
- (a) (1) Draw waveform for following signals.
 - (i) Sinusoidal (ii) triangular (iii) square.
 - (2) Draw a practical current source & ideal voltage source.
 - (b) Explain Bridge rectifier with suitable diagram and waveforms and give its applications.
 - (c) (i) Derive relationship between α (alpha) and β (beta).
 - (ii) Draw circuit diagram of BJT in CC configuration.
 - (iii) Draw symbol of N-P-N and P-N-P transistors.
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