

22310

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 next main Question on a new page.
- (3) Illustrate your answers with neat sketches wherever necessary.
- (4) Figures to the right indicate full marks.
- (5) Assume suitable data, if necessary.
- (6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

SECTION - I

1. Attempt any SIX of the following. 12
- a) Define :
- (i) Electric circuit
- (ii) Magnetic circuit
- b) State the meaning of “Magnetic Hysteresis”.
- c) Define :
- (i) Peak factor
- (ii) Form factor
- d) In a simple AC series circuit, voltage is leading current by 30° . State the nature of circuit and compute circuit power factor.
- e) Define : Transformer.
- f) State the principle of electromagnetic induction.
- g) State four types of single-phase induction motor.

P.T.O.

2. Attempt any THREE of the following. 12

- a) Draw a neat phasor diagram and derive relationship between line voltage and phase voltage in balanced star connection.
- b) An alternating voltage is given by,
 $v = 200 \sin(314.2t)$ volt
Determine :
(i) Peak voltage
(ii) Frequency
(iii) Time period
(iv) Voltage magnitude at $t = 15$ msec.
- c) Describe with neat sketch, the working principle of an autotransformer
- d) With neat sketch, explain difference between Core-type transformer and Shell-type transformer.

3. Attempt any TWO of the following. 12

- a) Explain the phenomenon of
(i) Statically induced emf
(ii) Dynamically induced emf
State the laws used to identify the direction or polarity of above types of emfs.
- b) i) A coil having resistance of 50Ω and an inductance of 0.2 H is connected to 1-phase, 230 V , 50 Hz AC supply.
Determine 4
(1) Inductive reactance
(2) Impedance
(3) Coil current
(4) Power consumed by the coil
ii) What is Universal motor ? 2
- c) With neat sketch, describe the construction and working principle of single-phase induction motor. Give its two applications.

SECTION - II

- 4. Attempt any FIVE of the following. 10**
- a) Define :
 - (i) Active component
 - (ii) Passive component
 - b) State any two parameters of a signal and also state their meaning.
 - c) State significance of filter in electronic circuits.
 - d) Draw symbol of zener diode and state its unique feature which differs it from ordinary diode.
 - e) Draw construction and symbol of PNP-type transistor.
 - f) Draw circuit diagram of CB configuration.
- 5. Attempt any THREE of the following. 12**
- a) Distinguish clearly between Ideal and Practical voltage source with the help of their characteristic curves.
 - b) Distinguish clearly between Analog IC and Digital IC.
 - c) With the help of characteristic diagram, explain various operating regions of transistor.
 - d) Define current gains Alpha (α) and Beta (β) of transistor configurations and derive relation between them.
- 6. Attempt any TWO of the following. 12**
- a) With neat constructional sketch, explain the working of Light Emitting Diode (LED)
 - b) With the help of neat circuit diagram, explain working of bridge type rectifier. Draw input-output voltage waveforms.
 - c) (i) Explain how to obtain value of given resistor using colour code. 3
 - (ii) Explain how to obtain value of given capacitor using colour code 3
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