

22232

21718

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.
 - (7) Use of Non-programmable Electronic Pocket Calculator is permissible.
 - (8) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

SECTION – I

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| 1. Attempt any SIX of the following : | 12 |
| (a) Define : (i) Electromagnetism (ii) Magnetic flux. | |
| (b) List the types of induced emf. | |
| (c) With the help of waveforms and phasor diagrams, show the phase relationship between voltage and current in pure inductive circuit. | |
| (d) Define : (i) Inductive reactance (ii) Impedance. | |
| (e) State the working principle of 1ϕ transformer. | |
| (f) State the types of single phase induction motors. | |
| (g) Write emf equation of a transformer. | |

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

- (a) State Faraday's first and second law of electromagnetic induction.
- (b) Draw series R-C circuit. Write its expression for impedance and show it on impedance triangle.
- (c) Define : (i) Efficiency (ii) Voltage regulation of transformer.
- (d) Compare autotransformer with two winding transformer. (4 points)

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

- (a) Draw and explain B-H curve.
- (b) An alternating voltage is represented by the expression : $V = 25 \sin (200 \pi t)$.
Calculate : (i) Amplitude (ii) Time period (iii) RMS value (iv) Average value
(v) Form factor (vi) Crest factor.
- (c) A 200 kVA, 3300/240 V, 50 Hz single phase transformer has 80 turns on secondary winding.

Calculate :

- (i) Primary and secondary currents on full load.
- (ii) Maximum value of flux.
- (iii) Number of primary winding turns.

SECTION – II

- 4. Attempt any FIVE of the following : 10**
- (a) Compare analog and digital ICs.
 - (b) Define passive components and classify them.
 - (c) List any two applications of LED.
 - (d) Draw symbols of : (i) Zener diode (ii) LED.
 - (e) State why transistor is called as a bipolar device.
 - (f) List the different transistor configurations.
- 5. Attempt any THREE of the following : 12**
- (a) Find the resistor value from the given colour coding :
 - (i) Blue Grey Black Red Gold.
 - (ii) Brown Black Black Silver
 - (b) State the need for filters and list the different types of filters.
 - (c) Derive the relationship between α & β of transistor.
 - (d) Explain ideal voltage source with suitable diagram.
- 6. Attempt any TWO of the following : 12**
- (a) Draw symbols for : (i) Resistor (ii) Capacitor (iii) Inductor (iv) PNP transistor (v) NPN transistor (vi) PN junction diode.
 - (b) Draw and explain bridge rectifier with shunt capacitor filter.
 - (c) Draw : (i) Input characteristics of transistor in CE mode.
 - (ii) Output characteristics of transistor in CE mode and show different regions on it.
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