

22310

11819

3 Hours / 70 Marks

Seat No.

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- 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) Use of Non-programmable Electronic Pocket Calculator is permissible.

**SECTION - A**

- |   | <b>Marks</b> |
|---|--------------|
| <b>1. Attempt any SIX of the following :</b>  | <b>12</b>    |
| (a) Define permeability.  |              |
| (b) Define MMF.   |              |
| (c) Define form factor of an alternating quantity.  |              |
| (d) Define frequency and time period of an alternating quality.   |              |
| (e) Define transformation ratio of transformer.   |              |
| (f) State the EMF equation of a $1\phi$ transformer and state the meaning of each term used.                                      |              |
| (g) Give two applications of single phase motors.   |              |
| <b>2. Attempt any THREE of the following :</b>  | <b>12</b>    |
| (a) Draw and explain B – H curve.   |              |
| (b) Draw a balanced 3-phase star connected load. Show various line and phase values and also state the relationship between them. |              |
| (c) Explain the working principle of $1\phi$ transformer.   |              |
| (d) Explain the working principle of $1\phi$ motor with a neat diagram.   |              |

- 3. Attempt any TWO of the following :** **12**
- (a) State and explain Faraday's laws of electromagnetic Induction.
  - (b) An inductance of 0.1H and a resistance of  $50\Omega$  are connected in series across a 220 V, 50 Hz AC supply.  
Determine : (i) Impedance (ii) Current (iii) Power factor (iv) Power Consumed
  - (c) Derive the EMF equation of a  $1\phi$  transformer.

**SECTION - B**

- 4. Attempt any FIVE of the following :** **10**
- (a) Define Active component. Give two examples.
  - (b) Draw the symbol of PN-junction diode and give two applications.
  - (c) Draw the symbols of PNP and NPN transistor.
  - (d) Define PIV.
  - (e) Draw the symbol of ideal voltage source and ideal current source.
  - (f) Define  $\alpha$  and  $\beta$  of a transistor.
- 5. Attempt any THREE of the following :** **12**
- (a) Define amplitude and phase of a sinusoidal quantity.
  - (b) Explain the constructional details of LED.
  - (c) Explain zener diode as a voltage regulator.
  - (d) Find the value of resistor from the given colour code :
    - (i) Red Red Red Gold
    - (ii) Blue Orange Green Silver
  - (e) Explain with neat diagram how transistor can be used as a switch.
- 6. Attempt any TWO of the following :** **12**
- (a) Differentiate between analog and digital ICs.
  - (b) Explain the working of half wave rectifier with suitable diagram.
  - (c) Draw the diagram of transistor operating regions.
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