

17353

16117

3 Hours / 100 Marks

Seat No.

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- Instructions :**
- (1) All Questions are *compulsory*.
 - (2) Answer each section on same 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.

Marks

SECTION – I

1. Attempt any SEVEN of the following :

7 × 2 = 14

- (a) List the components of power systems.
- (b) State the necessity of earthing.
- (c) Draw neat lable diagram for star-delta starters.
- (d) State the uses of digital multimeter.
- (e) List the types of single phase induction motor.
- (f) Define transformation ratio and efficiency of a transformer.
- (g) How to select proper type of single phase induction motor.
- (h) State the factors for selection of motor for different drives.
- (i) Give the classification of drives.
- (j) List different types of enclosures.

2. Attempt any FOUR :

4 × 3 = 12

- (a) Define :
 - (i) Average value
 - (ii) r.m.s. value
 - (iii) frequency

- (b) Explain with neat diagram working principle of PMMC instrument.
- (c) Explain the concept of energy audit.
- (d) Describe the working principle of autotransformer.
- (e) State the working principle of electric welding and give its applications.
- (f) State the importance of p.f. improvement and write the methods to improve p.f.

3. Attempt any FOUR :**4 × 3 = 12**

- (a) Explain the construction and working principle of transformer.
- (b) Explain the working principle of clip on meter with suitable diagram.
- (c) Draw speed-torque curves for induction motor and explain how to calculate slip of induction motor.
- (d) Explain the shaded pole induction motor with construction diagram and give it's two applications.
- (e) Explain the load test for efficiency and regulation of transformer.
- (f) Distinguish between AC and DC supply.

4. Attempt any FOUR :**4 × 3 = 12**

- (a) A 6600 V/600 V, 50 Hz 1- ϕ transformer has a maximum flux density of 2.15 Wb/m² in its Core. If the neat crosssectional area of iron in the core is 0.5 m². Calculate the number of turns in the primary and secondary winding of the transformer.
- (b) Write the steps for trouble shooting during installation of machines.
- (c) Draw starters direct on line starters and explain it's working principle.
- (d) List the different types of lamps with their ratings and applications.
- (e) Explain working principle of electroplating.
- (f) State the line and phase relationship between voltage and current in a star and delta connection.

SECTION – II**5. Attempt any NINE of the following :****9 × 2 = 18**

- (a) Draw the symbol for SCR and TRIAC
- (b) Define :
 - (i) Intrinsic
 - (ii) Extrinsic semiconductor
- (c) Draw the symbol of LED and give its any two applications.
- (d) Draw the VI characteristics of zener diode.
- (e) Write the types of BJT and draw their symbols.
- (f) Draw the output characteristics of CE configuration.
- (g) State the need of filter circuit in power supply.
- (h) What is rectifier ? Name different types of rectifier.
- (i) Give the difference between LC and TT types filters.
- (j) State the meaning of negative and positive logic.
- (k) Draw the symbol for NAND gate. Also write its truth table.
- (l) State the De-Morgan first and second theorem.

6. Attempt any FOUR of the following :**4 × 4 = 16**

- (a) Explain the PN junction diode in forward biasing and draw its VI characteristic.
- (b) Give the difference between conductors and semiconductor (any 4 points).
- (c) Describe single stage CE amplifier with suitable circuit diagram.
- (d) With the help of neat diagram, explain the working of center tapped full wave rectifier.
- (e) Draw the block diagram for power supply and explain the working of each block.
- (f) Reduce the expression using Boolean algebra
$$Y = (B + CA) (C + \bar{A}B)$$

P.T.O.

7. Attempt any FOUR of the following :

4 × 4 = 16

- (a) State the different types of LED digital display.
 - (b) Draw the energy band diagram for semiconductor and insulators and explain its properties.
 - (c) State any two applications of SCR and TRIAC.
 - (d) State the concept of power amplifier and state different types of power amplifier.
 - (e) Define inductor and capacitor and state their applications.
 - (f) Explain the junction break down in P-N junction diode.
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