

# 17424

16117

**3 Hours / 100 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) Figures to the right indicate full marks.  
(5) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

**Marks**

## SECTION - I

1. Attempt any NINE of the following: 18
- State Ohm's law.
  - The resistance of  $4\Omega$  and  $2\Omega$  are connected in series 60V DC supply. Find current and power supplied to this circuit.
  - Different between core type and shell type transformer (any two points).
  - State necessity of starter.
  - State the type of transformer on the basis of voltage.
  - State the function of fuse. Name the material used for fuse wire.
  - Write two application of three phase Induction motor.
  - Write two safety precaution to be taken while handling an electrical equipment.
  - A 6 pole 3-phase Induction motor operates from a supply whose frequency is 50Hz. Calculate synchronous speed of the motor.

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- j) List various parts of DC machine.
- k) “An induction motor cannot run at synchronous speed”. Give reason.
- l) State the necessity of earthing.

**2. Attempt any FOUR of the following: 16**

- a) Write four point of comparison between single phase supply system and three phase supply system.
- b) A single phase transformer of 50Hz has max. flux in the core as 0.021 Wt., the no. of turns in primary being 460 and that on secondary is 52. Calculate emf induced in primary and secondary winding of a transformer.
- c) Draw different types of DC motors with circuit diagram and give an industrial application of the each type.
- d) Differentiate between AC and DC supply (any four point)
- e) Describe with the circuit diagram the operation of resistors split single phase induction motor.
- f) Describe the operation of Incandescent lamp with neat connection diagram.

**3. Attempt any FOUR of the following: 16**

- a) Describe working principle of auto transformer.
- b) Draw wiring diagram of godown wiring and describe the working.
- c) Draw neat construction sketch of auto transformer and state its two merits.
- d) Describe with a circuit diagram operation of C-split single phase induction motor.
- e) Draw and explain different type of wire. (any two)
- f) State the necessity of starter for dc motor. Also two application of DC series motor and DC shunt motor.

**SECTION - II**

- 4. Attempt any NINE of the following:** **18**
- a) Define semiconductor. Draw the energy band diagram of it.
  - b) Define intrinsic semiconductor. List any two doping materials to form N-type semiconductor material.
  - c) Draw the symbol of SCR. List any two application of SCR.
  - d) Draw the symbol of NPN and PNP transistor.
  - e) Why NAND and NOR gate are called universal gates?
  - f) Draw the symbol of AND gate and OR gate.
  - g) List any two application of TRIC.
  - h) What is an amplifier? State the types of power amplifiers.
  - i) Draw symbol of light emitting diode. State any two application of LEDs.
  - j) What is filter? State the need of filter.
  - k) List the types of digital display.
  - l) Draw the symbol of resistor, inductor and capacitor.
- 5. Attempt any FOUR of the following:** **16**
- a) Define with example
    - (i) conductor
    - (ii) semiconductor
    - (iii) Insulator
  - b) Draw and explain working of NPN transistor.
  - c) Draw circuit diagram of single stage CE amplifier and state function of each component.
  - d) Explain with diagram principle of zener shunt regulator.
  - e) Draw the circuit of bridge rectifier with i/p and c/p wave form. Describe its working.
  - f) Write the De Morgan's theorem, prove any one theorem.

**6. Attempt any FOUR of the following:****16**

- a) Describe the working of TRIAC along with its construction.
  - b) Describe the working principle of LED along with its construction. List any two application of its.
  - c) Draw and explain the diagram of LC filter with their c/p waveform.
  - d) Draw circuit diagram of half wave rectifier explain working with their input and output waveform.
  - e) Explain with diagram construction and symbol of zener diode.
  - f) Differentiate between Intrinsic and Extrinsic Semiconductor.
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