

# 17424

**21415**

**3 Hours / 100 Marks**

Seat No.

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- Instructions* – (1) All Questions are *Compulsory*.  
(2) Illustrate your answers with neat sketches wherever necessary.  
(3) Assume suitable data, if necessary.  
(4) 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**
- Find the current rating of fuse required for series circuit of two 100 w/200 V lamps.
  - Two resistance of 10  $\Omega$  and 5  $\Omega$  are connected in parallel across 100 V dc supply. Find current and power supplied by DC source.
  - Define the terms:
    - Instantaneous value and
    - Time period.
  - State the methods used for speed control dc shunt motor.
  - Draw Speed Vs Torque characteristic for DC series motor.
  - State any two chemical plant applications of DC shunt motor.
  - “An induction motor can not run at synchronous speed”. Give justification.
  - State any two applications R-split induction motor.
  - What is ideal transformer? How it differs from practical transformer?

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- j) Give classifications of transformer according to their construction.
- k) List the different types of wire used in electrical wiring.
- l) Draw construction of incandescent lamp.

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

- a) Compare single phase and three phase A.C. supply by four points.
- b) (i) State Ohm's law.  
(ii) State principle of electromagnetic induction.
- c) What is starter? State its necessity in DC motor.
- d) List the different parts of DC machine. State function of any two parts.
- e) State any four parts and their materials used for three phase induction motor.
- f) With neat construction, explain working of C-split type of induction motor.

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

- a) Compare core-type and shell-type transformer by four points.
- b) For 12 KVA, 440 V/200 V, 50 Hz, 1  $\phi$  transformer, find:
  - (i) Primary current
  - (ii) Secondary current
  - (iii) Turns ratio and
  - (iv) No. of turns on primary side.
- c) State working principle of ELCB. State its two applications.
- d) Draw the wiring diagram of staircase wiring and explain its working.
- e) State need of earthing. List different types of earthing.
- f) Compare two winding transformer with auto transformer by four points.

SECTION - II

- 4. Attempt any NINE of the following: 18**
- Draw the symbol of capacitor. State any two applications of capacitor.
  - Define intrinsic and extrinsic semiconductor.
  - Which charge carriers are majority and minority carriers in P-type and N-type semiconductor.
  - State any two applications of SCR.
  - Draw the symbol of NPN and PNP transistor. Label its terminals.
  - What is amplifier? State the types of power amplifier.
  - Draw the block diagram of regulated power supply.
  - Enlist the different types of filters used in regulated power supply.
  - State the need of voltage regulators.
  - Draw the logic symbol and truth table of NAND gate.
  - What is negative and positive logic?
  - State De-Morgan's theorems.
- 5. Attempt any FOUR of the following: 16**
- Draw the V-I characteristics of SCR. Explain different modes of operation of SCR.
  - Describe the working principle of TRIAC with the help of neat sketch. Also state its two applications.
  - Describe the working principle of LED with the help of neat sketch. List its two applications.
  - Explain the working of single stage CE amplifier with the help of neat circuit diagram.
  - Compare half wave and full wave rectifier with respect to number of diodes used, efficiency, ripple factor and output waveform.
  - State and prove the commutative and associative law of Boolean algebra.

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

- a) Draw symbol of zener diode and P-n diode. Draw V-I characteristics of zener diode.
  - b) Draw the forward and reverse V-I characteristics of diode. Define cut-in voltage or knee voltage of diode. State the value of knee voltage for silicon diode.
  - c) Describe the working of NPN transistor with the help of neat sketch.
  - d) Describe the working principle of zener diode as a shunt regulator with the help of neat circuit diagram.
  - e) Describe the working of shunt capacitor filter with the help of neat sketch.
  - f) Explain types of LED display with neat sketches.
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