

17424

21314

3 Hours / 100 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) Assume suitable data, if necessary.
(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

- a) State Ohm's law.
- b) Define electrical power and energy.
- c) State necessity of starter.
- d) What is earthing?
- e) Two resistances of $4\ \Omega$ and $5\ \Omega$ are connected in series across 120 V DC supply. Find current and power supplied to this circuit.
- f) State the types of transformer on the basis of voltage.
- g) Why single phase induction motors are not self starting.
- h) State any two advantages of three phase system over single phase system.
- i) Why transformer core is laminated.
- j) Name the various parts of DC machine.
- k) State necessity of earthing.
- l) Sates the types of wires.

P.T.O.

- 2. Attempt any FOUR of the following:** **16**
- a) Differentiate between AC and DC supply (any four points).
 - b) State the function of no volt coil and overload coil in case of DC shunt motor starter.
 - c) Describe with the circuit diagram, the operation of resistors split single phase induction motor.
 - d) Draw and explain core and shell type transformer.
 - e) Describe the operation of incandescent lamp with neat connection diagram.
 - f) A coil connected in parallel across 120 V DC supply takes a current 2 A find:
 - i) Resistance of the coil.
 - ii) Power dissipated in the coil.
 - iii) Total energy consumed in 2 hours.
- 3. Attempt any FOUR of the following:** **16**
- a) Draw circuit diagram of different types of DC motors and give one industrial application of each type.
 - b) Describe working principle of auto transformer.
 - c) Suggest various safety precautions which should be taken while working with electricity.
 - d) Draw wiring diagram of godown wiring and describe the working.
 - e) Compare squirrel cage and slip ring type three phase induction motors (any four points).
 - f) A single phase transformer has voltage ratio 230/115 Volts. It has hundred turns on primary, find the secondary turns, the secondary and primary full load currents.

SECTION - II

- 3. Attempt any NINE of the following:** **18**
- a) Define semiconductor. Draw the energy band diagram of it.
 - b) Define intrinsic semiconductor. List any two dopant materials to form N-type semiconductor material.
 - c) Draw the symbol of LED and zener diode.
 - d) Draw the symbol of SCR. List any two applications of SCR.
 - e) Draw the construction diagram of PNP transistor and name the regions and terminals.
 - f) What is power amplifier? Define it.
 - g) What is the need of regulated power supply?
 - h) What is filter? State the need of filter.
 - i) Draw the circuit diagram of π -filter.
 - j) Draw the symbol of EX-OR gate. Write the truth table of it.
 - k) Write the logic expression for OR gate and NAND gate.
 - l) List the types of digital display.
- 4. Attempt any FOUR of the following:** **16**
- a) Draw the energy band diagram for insulator and conductor. Write the values of band gap for insulator and semiconductor.
 - b) Describe the working of TRIAC along with its construction.
 - c) Describe the operation of zener diode in reverse bias mode. Draw the V-I characteristics of zener diode.
 - d) Draw the circuit diagram of single stage CE amplifier. Write the working of it.
 - e) Draw the circuit of bridge rectifier. Describe its working.
 - f) Write the De Morgan's theorem. Prove any one theorem.

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

- a) Describe the working principle of LED along with its construction. List any two applications of it.
 - b) Define inductor and capacitor. Draw symbol and list two applications of each.
 - c) Describe the working of NPN transistor.
 - d) Draw and explain the diagram of LC filter with their output waveform.
 - e) Describe the working of zener shunt regulator along with neat circuit diagram.
 - f) Which gates are called as universal gates? Draw basic gates using any one universal gate.
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