17424

21718

3 Hours / 100 Marks Seat No. | | | | | | | | |

Instructions – (1) All Questions are *Compulsory.*

(2) Answer each Section on separate answer sheet.

(3) Illustrate your answers with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

(6) 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) State principle of electromagnetic induction.

c) What is necessity of starter.

d) List two applications of D.C. motors related to chemical plant.

e) Define voltage ratio and current ratio of 1ϕ transformer.

f) State the necessity of fuse.

g) What is the necessity of earthing.

h) Define transformation ratio of single phase transformer and write EMF equation.

i) Define electrical power and energy.

Marks

j) Two resistance of 8Ω and 4Ω are connected in series with parallel resistance of 12Ω to a battery of 60 volt. Calculate

(i) Total effective resistance

(ii) Total current

k) State the methods used for speed control dc shunt motor.

l) Define A.C. and D.C. supply with their representation.

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) List the different parts of DC machine. State function of any two parts.

c) Describe with a circuit diagram, the operation of resistance split phase run single phase induction motor.

d) Compare core type and shell type transformer. (any four points)

e) Describe the operation of mercury vapour lamp with neat connection diagram.

f) State the meaning of the terms MCCB and ELCB and give their applications.

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

a) Draw the wiring diagram of staircase wiring and explain its working.

b) Compare two winding transformer with auto transformer by four points.

c) For 12 KPA, 440 V/200V, 50 Hz 1ϕ transformer find,

(i) Primary current

(ii) Secondary current

(iii) Turns ratio and

(iv) No. of turns on primary side

d) Describe with a circuit diagram, the operation of capacitor start induction run single phase induction motor.

Marks

e) Compare squirrel cage and slip ring type three phase induction motors. (any four points)

f) State the function of no volt coil and overload coil in case of DC shunt motor starter.

SECTION – II

4. Attempt any NINE of the following: **18**

a) Define semiconductor. Draw the energy band diagram for semiconductor.

b) List the minority and majority charge carriers in N-type semiconductor.

c) Draw the V-I characteristic of zener diode in reverse bias.

d) List one application of -

(i) LED and

(ii) Zener diode

e) What is the meaning of BJT?

f) What is power amplifier? State the types of power amplifier.

g) What is the meaning of regulator in voltage regulator?

h) Draw the input and output waveform of full wave rectifier.

i) Draw the block diagram of regulated power supply.

j) Draw the symbol of

(i) AND gate and

(ii) NAND gate

k) Write DeMorgan's first theorem.

l) What is the meaning of negative logic?

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

a) Draw the symbol of SCR and Triac. Describe the working of SCR.

b) Define extrinsic semiconductor. List it's types and materials used for doping.

Marks

c) Write two applications of

(i) LED

(ii) P.N junction diode and

(iii) Zener diode

Draw the characteristics of PN junction diode.

d) (i) Draw the circuit diagram of single stage CE amplifier.

(ii) Draw its Input and Output waveforms.

(iii) Write the use of C_e or C_E.

e) Draw the circuit diagram of bridge type full wave rectifier. List the advantages of this circuit over center-tapped type full wave rectifier.

f) (i) Draw the symbol of Ex-OR gate. Write its truth table and logic expression.

(ii) Draw the AND gate logic using NAND gates.

6. Attempt any <u>FOUR</u> of the following: **16**

a) (i) Describe the working of Triac with neat construction diagram.

(ii) List one application of

1) SCR and

2) Triac

b) Draw the symbols of inductor. Define inductor and capacitor write one application of inductor and capacitor.

c) Draw the characteristics of transistor in CE mode.

d) (i) Draw the circuit diagram of zener shunt regulator and describe its working.

(ii) What is the need of filter in power supply?

e) Compare half wave and full wave rectifier.

f) Explain the LED display or LCD display with neat diagram.
