

Scheme-G

Sample Test Paper- I

Course Name :- Diploma in Chemical/Plastic Engineering

Course Code :- CH/PS

Semester :-Fourth

Subject Title :- Electrical and Electronics (Section I & II)

Marks :- 25

17424

Time:- 1 hour

Instructions:

1. All questions are compulsory
2. Illustrate your answers with neat sketches wherever necessary
3. Figures to the right indicate full marks
4. Assume suitable data if necessary

Q.1 Attempt any THREE

(09 Marks)

- a) An electrical heater of 1.5 kW is used for 3 hours per day. Find –
 - i) Total energy consumed per month (30 days)
 - ii) The monthly bill if the rate is Rs. 5 per unit.
- b) State any three applications of DC motors used in chemical plant.
- c) Define synchronous speed, actual speed and slip of a three phase induction motor.
- d) Draw schematic diagram of single phase capacitor start induction run motor and state the function of synchronous switch.

Q.2 Attempt any TWO

(08 Marks)

- a) State the type of emf induced and the direction of current in the conductor shown in figure 1. Justify your answer.

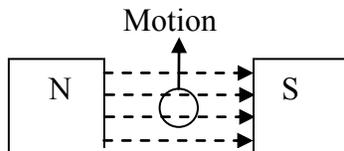


Figure 1

- b) State the methods by which the speed of a DC shunt motor can be controlled? State any two advantages and disadvantages of each method.
- c) The required no load voltage ratio in a single phase 50 Hz core type transformer is 6600/500. Find the number of turns in each winding if the flux is to be 0.06 Weber.

Q.3 Attempt any TWO

(08 Marks)

- a) Give reasons for the following:
 - i) Efficiency of a transformer is high compared to other electrical machines.
 - ii) The core of a transformer is laminated.
- b) In domestic iron and mixer which part is earthed? Why?
- c) Draw a neat connection diagram of a fluorescent tube and explain its working.

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Scheme-G
Sample Test Paper- II

Course Name :- Diploma in Chemical/Plastic Engineering

Course Code :- CH/PS

Semester :-Fourth

Subject Title :- Electrical and Electronics (Section I & II)

Marks :- 25

17424

Time:- 1 hour

Instructions:

1. All questions are compulsory
2. Illustrate your answers with neat sketches wherever necessary
3. Figures to the right indicate full marks
4. Assume suitable data if necessary

Q.1 Attempt any THREE

(09 Marks)

- a) Draw V-I characteristics of P-N junction diode for forward and reverse bias conditions.
- b) Explain the constructional structure of PNP and NPN transistors and show their symbols.
- c) Draw the output characteristics of transistor in common emitter mode. Show its different regions.
- d) State what is an AND gate? Give its logic symbol and truth table.

Q.2 Attempt any TWO

(08 Marks)

- a) Compare transistor and SCR (any four points).
- b) State applications of LEDs. Why should you prefer LEDs over conventional lamps?
- c) What is the difference between reverse breakdown in a PN junction diode and zener breakdown?

Q.3 Attempt any TWO

(08 Marks)

- a) Draw the circuit diagram of full wave rectifier using centre tap transformer and describe its working.
- b) Compare series inductor filter and shunt capacitor filter (any four points).
- c) State De Morgan's first theorem and prove it with the help of truth table.

Scheme-G

Sample Question Paper

Course Name :- Diploma in Chemical/Plastic Engineering

Course Code :- CH/PS

Semester :-Fourth

Subject Title :- Electrical and Electronics (Section I & II)

Marks :- 100

17424

Time:- 3 hour

Instructions:

1. All questions are compulsory
2. Illustrate your answers with neat sketches wherever necessary
3. Figures to the right indicate full marks
4. Assume suitable data if necessary
5. Preferably, write the answers in sequential order

Section-I

Q. 1 Attempt any NINE

(18 Marks)

- a) Calculate current rating of a fuse required for a parallel circuit of five 100 W/250V lamps.
- b) Two resistances of $5\ \Omega$ and $3\ \Omega$ are connected in series across 80 V DC supply. Find current and power supplied to this circuit.
- c) State any two advantages of three phase system over single phase system.
- d) State the methods by which the speed of DC shunt motor can be controlled?
- e) Why DC series motors are suitable for electric traction and cranes?
- f) Name the various parts of DC machine.
- g) How single phase induction motors are made self starting?
- h) "An induction motor cannot run at synchronous speed." Give reason.
- i) A single phase transformer has voltage ratio 230/115 Volts. It has hundred turns on primary find the secondary turns.
- j) State the types of transformers on the basis of construction.
- k) Why transformer core is laminated?
- l) State the function of fuse? Name the material used for fuse wire.

Q.2 Attempt any FOUR**(16 Marks)**

- a) Explain why it is required to improve the power factor?
- b) State the function of 'no volt coil' and 'overload coil' in case of DC shunt motor starter.
- c) Compare squirrel cage and slip ring type three phase induction motors (any four points).
- d) A 5 kVA, 220/110 V, 50 Hz, single phase transformer has 55 turns on the secondary.
Determine the number of turns in the primary, the secondary and primary full load currents.
- e) State the meaning of the terms MCCB and ELCB and give their applications.
- f) Draw wiring diagram of staircase wiring and describe the working.

Q.3 Attempt any FOUR**(16 Marks)**

- a) A coil connected in parallel across 100 V DC supply takes a current of 2 A. Find-
 - i) Resistance of the coil
 - ii) Power dissipated in the coil
 - iii) Total energy consumed in 2 hours.
- b) Draw circuit diagrams of different types of DC motors and give one industrial application of each type.
- c) Describe with a circuit diagram, the operation of capacitor start induction run single phase induction motor.
- d) State the difference between two winding transformer and auto transformer? Give two applications of auto transformer.
- e) Suggest various safety precautions which should be taken while working with electricity.
- f) Describe the operation of mercury vapour lamp with neat connection diagram.

Section-II

Q.1 Attempt any NINE**18 Marks**

- a) What are insulators? Give its example.
- b) Which charge carriers are majority and minority carriers in P-type semiconductor?
- c) What is breakdown in diodes? State its types?
- d) Draw symbol of light emitting diode. State any two applications of LEDs.
- e) Draw the structure of PNP transistor and show its symbol.
- f) What is an amplifier? State the types of power amplifiers.
- g) State, why filter is required in DC regulated power supply?

- h) Draw the input and output waveform of half wave rectifier.
- i) Draw the block diagram of regulated power supply.
- j) Which gates are called as universal gates? Why?
- k) What is an OR gate? Draw its logic symbol.
- l) State truth table of two input EX-OR gate.

Q.2 Attempt any FOUR

16 Marks

- a) Draw energy level diagram of a conductor and semiconductor and describe the term forbidden energy gap.
- b) Describe the working of SCR with the help of a neat sketch. Also state its two applications.
- c) Describe the operation of zener diode and draw its V-I characteristics.
- d) Draw the circuit diagram of single stage CE amplifier and describe its working.
- e) Describe the working of full wave bridge type rectifier with the help of a neat circuit diagram.
- f) State De Morgan's second theorem and prove it with the help of truth table.

Q.3 Attempt any FOUR

16 Marks

- a) Describe the working of TRIAC with the help of a neat sketch. Also state its two applications.
- b) Define inductor and capacitor. Draw their symbols and state two applications of each.
- c) Draw and describe input and output characteristics of transistor in common emitter mode.
- d) Describe the working of π type filter with a neat sketch.
- e) Compare half wave and full wave centre tapped type rectifier (any four points).
- f) Explain types of LCD display with neat diagram.