

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/
MANAGEMENT/COMMERCIAL PRACTICE — OCTOBER, 2018

INDUSTRIAL ELECTRONICS & PLC

[Time : 3 hours

(Maximum marks : 100)

PART — A

(Maximum marks : 10)

Marks

I Answer *all* questions in one or two sentences. Each question carries 2 marks.

1. Define Triggering of a Thyrister.
2. State the principle of Cyclo Converter.
3. List the types of UPS.
4. Draw a Normally Open Contact and a Normally Closed Contact in PLC.
5. Define Commutation of SCR.

(5 × 2 = 10)

PART — B

(Maximum marks : 30)

Answer any *five* of the following questions. Each question carries 6 marks.

1. Draw the structure of Power MOSFET, list any four advantages compared to BJT.
2. Describe the modes of operations of TRIAC.
3. Explain a single phase half wave controlled rectifier with RL load.
4. Explain a series inverter circuit with necessary circuits and waveforms.
5. Draw the block diagram of Off-Line UPS and explain.
6. Compare AC and DC drives.
7. Draw the ladder diagram for $OUT = A \cdot \bar{B} + C$, and explain.

(5 × 6 = 30)

PART — C

(Maximum marks : 60)

(Answer *one* full question from each unit. Each full question carries 15 marks.)

UNIT — I

- III (a) Explain RC triggering method of SCR. 8
 (b) Classify commutation techniques used with SCR and explain natural commutation. 7

OR

- IV (a) Explain the structure of DIAC and draw the VI characteristics. 8
 (b) Explain the characteristics of IGBT with necessary diagrams. 7

UNIT — II

- V (a) Analyze the load waveforms in single phase midpoint converter with RL load, explain how it differ from a circuit with R load. 8
 (b) Explain Jone's Chopper with circuit diagram. 7

OR

- VI (a) Explain a single phase dual converter with waveforms. 8
 (b) Explain the working of a parallel inverter circuit. 7

UNIT — III

- VII (a) Explain variable voltage variable frequency speed control of induction motors. 8
 (b) Explain the principle of induction heating, list its disadvantages. 7

OR

- VIII (a) Explain the different types of resistance welding. 8
 (b) Explain dielectric heating and list any four applications. 7

UNIT — IV

- IX (a) Draw the ladder diagram for a half subtractor circuit and explain. 8
 (b) Explain the major functional units in a PLC. 7

OR

- X (a) Draw the ladder diagrams for the gates
 (i) AND (ii) OR (iii) NOT (iv) EX-OR 8
 (b) What are the advantages of PLC ? 7