

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 Thyristor.
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

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

EMBEDDED SYSTEMS

[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. List any two ATmega 8bit microcontrollers.
2. Mention the size of GPRS and I/O memory(SFR) in ATmega32.
3. List any two AVR data transfer instructions with format.
4. List any two data types in AVR C.
5. Mention any two application areas of embedded system.

(5 × 2 = 10)

PART — B

(Maximum marks : 30)

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

1. Explain general purpose registers of ATmega32 microcontroller.
2. Explain the features of AVR family.
3. Name different AVR arithmetic and logic instructions with formats.
4. Explain I/O port programming in AVR.
5. Explain AVR timer-o programming.
6. Explain AVR serial communication.
7. Explain different embedded OS.

(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 ATmega32 microcontroller with block diagram. 8
 (b) Explain ATmega32 data memory with a suitable diagram. 7

OR

- IV (a) Explain different addressing modes of ATmega32 microcontroller. 8
 (b) Explain ATmega32 status registers with bit format. 7

UNIT — II

- V (a) A switch is connected to pin PA0 and an LED connected to pin PA7, write an AVR assembly program to get the switch status and send it to LED. 8
 (b) Explain different branching and looping instructions in AVR. 7

OR

- VI (a) A door sensor is connected to PB3 and a buzzer is connected to port PC5. Write an assembly program to turn on buzzer when sensor out put is high. 8
 (b) Explain macros and subroutines. 7

UNIT — III

- VII (a) Explain ATmega32 connection to RS232. 8
 (b) Explain AVR interrupts and its priority. 7

OR

- VIII (a) Explain different logic operators in AVR C. 8
 (b) Write an AVR C program to turn ON/OFF an LED connected to port B with a delay of 2 milli second each. 7

UNIT — IV

- IX (a) Explain the architecture of an embedded system with a diagram. 8
 (b) Explain arduino development board. 7

OR

- X (a) Write the application areas and specialities of an embedded system. 8
 (b) Explain raspberry pie development board. 7

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/
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OPTICAL FIBRE COMMUNICATION

[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 acceptance angle.
2. Define the term population inversion.
3. List the types of optical amplifiers.
4. List two applications of beam splitters.
5. List the applications of optical isolators.

(5×2 = 10)

PART — B

(Maximum marks : 30)

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

1. Explain step index and graded index optical fibres.
2. Explain the different type of light rays passing through the optical fibre.
3. Explain the principle of modulation of LED.
4. Describe the working of LASER diode.
5. Explain the properties of optical amplifiers.
6. Draw the block diagram of optical transceivers.
7. Explain insertion loss method for the measurement of attenuation loss in optical fibre.

(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) Write short notes on :
 (i) Absorption (ii) Scattering (iii) Dispersion 9
 (b) Describe the principle of light transmission in optical fibre. 6

OR

- IV (a) Explain single mode and multimode optical fibres. 8
 (b) List the advantages of optical fibre communication. 7

UNIT — II

- V (a) Explain the working principle of avalanche photo diode. 8
 (b) Explain the theory of LASER. 7

OR

- VI (a) Explain the structure and working of edge emitting LEDs. 8
 (b) Explain the construction of laser diode. 7

UNIT — III

- VII (a) Explain the following optical amplifiers.
 (i) SOA (ii) Raman Amplifiers 8
 (b) Explain the block diagram of optical transmitter. 7

OR

- VIII (a) Explain the principle of EDFA. 9
 (b) Explain the basic concept of optical amplifiers. 6

UNIT — IV

- IX (a) Write short notes on :
 (i) Connectors (ii) Splicers 8
 (b) Explain inter and intra mode dispersion losses. 7

OR

- X (a) Explain bend losses occurred in optical fibre. 8
 (b) Explain the working principle and application of directional couplers. 7

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

INDUSTRIAL MANAGEMENT AND SAFETY

[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. List the major elements coming under the process of managing in management.
 2. What does the term apprentice denote ?
 3. Define quality.
 4. List any two techniques used in operation research (OR) to solve optimization problems.

5. Expand the following :

(a) TBI

(b) DSR

(5×2 = 10)

PART — B

(Maximum marks : 30)

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

1. List the advantages of training.
2. Explain the inventory models.
3. Identify the link between ISO-9001 and TQM.
4. Distinguish between CPM & PERT.
5. Explain Max min - Min max principle.

6. Define the terms :

(a) Factory

(b) Accident proness

(c) Unsafe act

7. Identify the functions of an entrepreneur.

(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 partnership organization and Co-operative society. 8
 (b) State the functions of human resource management. 7
 OR
 IV (a) Explain Henry Fayol's principles of management. 8
 (b) Define wages and list out different types of wages. 7

UNIT — II

- V (a) List the objectives of quality planning. 8
 (b) Describe the different methods of purchasing. 7
 OR
 VI (a) List the elements of ISO-9000 series. 8
 (b) Describe the centralized and decentralized stores. 7

UNIT — III

- VII (a) A project consist of six activities ABCDEF with durations as shown in the table. Draw the net work diagram and mark the critical path using AOA method.

Activity	Dependence	Duration in days
A		8
B	A	12
C	B	10
D	B	8
E	D	6
F	C, E	6

- (b) List the various techniques used in operation research (OR) to solve optimization problems in management. 7

OR

- VIII (a) A toy company produces two products cars and guns. Each car gives a profit of ₹ 10 and each gun gives a profit of ₹ 20. The car and gun are produced through two sections S1 and S2. In section S1 each car requires one hour and gun requires 4 hours. In section S2 each car requires 5 hrs and gun requires 3 hrs. The total time available in section S1 is 30 hrs and Section S2 is 40 hrs. The company wants to maximize their profit. Formulate a linear programming model for this process. 8
 (b) Define the following terms used in project management techniques :
 (i) Latest finish time, earliest finish time (ii) Critical path, slack (iii) Event 7

UNIT — IV

- IX (a) Explain the precautions to be observed while working on hazardous environment. 8
 (b) Identify the risk taking qualities of an entrepreneur. 7
 OR
 X (a) Explain the 4E's of accident prevention techniques. 8
 (b) List out the steps involved in starting a small scale industry. 7