

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

DIGITAL ELECTRONICS

[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. Give the 1's and 2's complements of 1101 1100.
2. Give the symbol and truth table of an XOR gate.
3. Define the term fan-in of a gate.
4. What do you mean by a sequential logic circuit ?
5. List the different types of ADC.

(5×2 = 10)

PART — B

(Maximum marks : 30)

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

1. What are the advantages and disadvantages of K-map ?
2. Explain a half subtractor circuit with truth table and logic diagram.
3. Draw and explain a serial in parallel out shift register.
4. Explain the working of a Johnson counter with diagram.
5. What is 'modulus' of a counter ? Give the truth table of a mod-8 counter.
6. Explain the operation of a 1 to 4 De-multiplexer.
7. Explain a flash type ADC.

(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) Perform the following operations.
- (i) 1000×1001
 - (ii) $110111 + 11010$
 - (iii) $1101101 + 101$
 - (iv) $(+15) + (-9)$ using 2's complement method.
- (b) What are universal gates ? Give examples.

OR

- IV (a) Simplify the Boolean function using K-map.
 $F = \sum m(0, 3, 7, 10, 14) + d(2, 4, 6, 9, 11, 13)$
- (b) State and explain De-Morgan's theorems.

UNIT — II

- V (a) Explain the working of a 3 bit encoder with truth table and logic diagram.
- (b) Define the terms Noise margin, Noise immunity and propagation delay.

OR

- VI (a) Design a full adder circuit.
- (b) Draw and explain a TTL inverter.

UNIT — III

- VII (a) Explain the working of master slave JK flip-flop with diagram.
- (b) Draw the truth tables of D and T flip-flops.

OR

- VIII (a) Explain the different types of shift registers with diagrams.
- (b) What is race around condition ? How it can be eliminated ?

UNIT — IV

- IX (a) Implement a mod-10 asynchronous counter using JK flip-flops.
- (b) Define resolution and accuracy of a DAC.

OR

- X (a) Explain the working of R-2R ladder type DAC with diagram.
- (b) Differentiate between asynchronous and synchronous counters.