TED (15) – 3042

(REVISION — 2015)

Reg. No.....

Signature .....

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)

Marks

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) $1101101 \div 101$

(iv) $(+15) + (-9)$ using 2's complement method. 12

(b) What are universal gates ? Give examples. 3

OR

IV (a) Simplify the Boolean function using K-map.

$F = \Sigma m\ (0, 3, 7, 10, 14) + d(2, 4, 6, 9, 11, 13)$ 9

(b) State and explain De-Morgan's theorems. 6

UNIT — II

V (a) Explain the working of a 3 bit encoder with truth table and logic diagram. 9

(b) Define the terms Noise margin, Noise immunity and propagation delay. 6

OR

VI (a) Design a full adder circuit. 9

(b) Draw and explain a TTL inverter. 6

UNIT — III

VII (a) Explain the working of master slave JK flip-flop with diagram. 10

(b) Draw the truth tables of D and T flip-flops. 5

OR

VIII (a) Explain the different types of shift registers with diagrams. 10

(b) What is race around condition ? How it can be eliminated ? 5

UNIT — IV

IX (a) Implement a mod-10 asynchronous counter using JK flip-flops. 10

(b) Define resolution and accuracy of a DAC. 5

OR

X (a) Explain the working of R-2R ladder type DAC with diagram. 10

(b) Differentiate between asynchronous and synchronous counters. 5
