TED (15) – 3042

(REVISION — 2015)

Reg. No...

Signature .... [P.T.O.

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)

[35]

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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