

THIRD SEMESTER DIPLOMA EXAMINATION IN ENGINEERING/
TECHNOLOGY — MARCH, 2015

DIGITAL COMPUTER PRINCIPLES

(Common for CT, CM and IF)

[Time : 3 hours

(Maximum marks : 100)

Marks

PART—A

(Maximum marks : 10)

I Answer the following questions in one or two sentences. Each question carries 2 marks.

1. Define minterm.
2. Draw the truth table of NAND gate.
3. Define propagation delay of logic gates.
4. State the use of encoder.
5. Define synchronous counters.

(5x2=10)

PART—B

(Maximum marks : 30)

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

1. Draw the symbols and truth tables of EX-OR and NOR gates.
2. Compare positive and negative logics.
3. Simplify $(A+B)(A+\bar{B})$.
4. State the use of digital comparator. Draw a 2-bit comparator and explain.
5. Draw and explain the working of full adder.
6. Explain the working of T flip flop with truth table and diagram.
7. Write short notes on right and left shift registers.

(5x6=30)

PART—C

(Maximum marks : 60)

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

UNIT – I

III (a) Find :

- (i) Gray code equivalent of $(13)_{10}$.
 (ii) Binary equivalent of 1111 Gray code.

7

(b) Write :

- (i) Hamming (7, 4) code for 0000 using even parity.
 (ii) Hamming (11,7) code for 1111111 using odd parity.

8

OR

IV (a) Convert the following numbers :

- (i) $(563)_{10}$ to Binary
 (ii) $(3764)_8$ to decimal
 (iii) $(10101001)_2$ to Hexadecimal.

9

(b) Explain about ASCII and EBCDIC codes.

6

UNIT – II

V (a) Simplify using K-map :

(i) $y_1 = \bar{A}\bar{B}\bar{C} + \bar{A}\bar{B}C + A\bar{B}\bar{C} + A\bar{B}C$

(ii) $y_2 = \bar{A}\bar{B}C + \bar{A}B\bar{C} + \bar{A}BC + A\bar{B}\bar{C} + ABC$

9

(b) Write short notes on sum of products and product of sums.

6

OR

VI (a) Simplify $(A+B)(\bar{A}+\bar{B}+C)(\bar{A}+\bar{B}+D)$

5

(b) Explain the circuit diagram of TTL and compare it with CMOS logic.

10

UNIT – III

VII (a) Explain the working of 1 to 8 demultiplexer with diagram.

8

(b) Explain the working of BCD to decimal decoder.

7

OR

VIII (a) Explain about BCD to seven segment decoder with necessary diagram.

9

(b) List the applications of multiplexers and demultiplexers.

6

UNIT – IV

IX (a) Explain about JK flip flop with truth table and diagram.

9

(b) Compare synchronous and asynchronous counters.

6

OR

X (a) Explain the working of asynchronous decade counter using flip flop.

8

(b) Explain the working of parallel-in serial-out shift registers.

7