

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

DIGITAL COMPUTER PRINCIPLES

[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. What is the binary equivalent of decimal 123.
2. Define min terms.
3. List the applications of de-multiplexer.
4. What does 74L prefix shows in TTL gate chips ?
5. List any two applications of counters.

(5 × 2 = 10)

PART — B

(Maximum marks : 30)

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

1. Draw symbols of AND, OR, NOT, NAND, NOR, EXOR gates.
2. List advantages of binary over decimal.
3. Give the features of CMOS logic gates.
4. Explain half adder circuit.
5. Explain encoder and decoder.
6. Compare synchronous and asynchronous counters.
7. Draw the truth table of master slave JK flip-flop.

(5 × 6 = 30)

## PART — C

(Maximum marks : 60)

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

## UNIT — I

- III Convert the following.
- (i) 7562.45 to octal.
  - (ii) Binary 11010111 to Octal and Decimal.
  - (iii) Hexadecimal 2AC5 to binary and octal. 15

OR

- IV (a) Explain error detection and correction. Also list the methods used. 8
- (b) Explain gray code with example. What is the use of gray code ? 7

## UNIT — II

- V Explain the Boolean postulates and theorems. 15

OR

- VI (a) Simplify the boolean expression  $xy + x'z + yz$  to minimum number of literals. 8
- (b) Distinguish between positive logic and negative logic. 7

## UNIT — III

- VII (a) Design a binary to excess 3 decoder. 8
- (b) Explain about full subtractor with diagram and truth table. 7

OR

- VIII (a) Compare combinational and sequential circuits. 8
- (b) Explain a BCD to decimal decoder. 7

## UNIT — IV

- IX (a) Explain D flipflop and T flip-flop with diagram and truth table. 8
- (b) Explain about "serial in serial out" and "serial in parallel out" shift registers. 7

OR

- X (a) Explain right shift register and left shift registers. 8
- (b) Explain ripple counter. 7