TED (15) –3133

Reg. No.............................................

(REVISION — 2015)

Signature ....................................

# DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE — OCTOBER, 2017

## 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.   State the number of symbols used in an Octal Number System.

2.   Full form of ASCII.

3.   Describe combinational Circuit.

4.   Name the flipflop used to construct a Ripple counter.

5.   Name an error detecting and correcting code.          (5×2 = 10)

## PART — B

(Maximum marks : 30)

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

1.   Draw the symbol and truth table of NOR & EX-OR gate.

2.   Map the expression f = A'B'C + A'BC' + AB'C'.

3.   Draw a logic diagram of a four input multiplexer.

4.   Describe SR Latch using NAND Gate.

5.   Construct a Johnson counter using D Flipflop.

6.   State the DAC Parameters - Offset voltage and Monotonicity.

7.   Illustrate the logic diagram of a memory cell.          (5×6 = 30)

[29]                                                    [P.T.O.

Marks

## PART — C

(Maximum marks : 60)

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

### Unit — I

III  (a) Convert the following :

   (i) $(2A0F.12)_{16}$ to Octal

   (ii) $(267.11)_8$ to Hexadecimal

   (iii) 167.12 to Binary      9

  (b) Expand A + B to minterms and maxterms.      6

Or

IV  (a) Describe and Prove Demorag'n Theorem.      9

  (b) Describe 3 basic gates with Truth Table.      6

### Unit — II

V  (a) Design a full Subtractor.      9

  (b) Reduce the expression $f = \Sigma m$ (0, 1, 2, 3, 5, 7, 8, 9, 10, 12, 13) using K-map.      6

Or

VI  Design a Gray to Binary Decoder.      15

### Unit — III

VII  (a) Demonstrate a JK Flipflop with truth table.      9

  (b) Construct a D Latch using a gated SR Latch.      6

Or

VIII  (a) Design a mod 6 counter using T FF.      9

  (b) Compare Synchronous and asynchronous counter.      6

### Unit — IV

IX  Explain a Counter type ADC.      15

Or

X  (a) Decode the message "1001001" coded in 7 bit Hamming code; assuming that at most a single error occurred in the code.      9

  (b) Develop a programming table for PAL for Boolean functions.

    w = ABC' + A'B'CD'

    x = A + BCD

    y = A'B + CD + B'D'

    z = ABC' + A'B'CD' + AC' D' + A' B' C' D      6