TED (15) – 3133

(REVISION — 2015)

Reg. No.....

Signature .....

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. Define binary codes.
2. Define minterm.
3. What is the function of an encoder ?
4. Define a flip-flop.
5. What is mean by resolution in DAC ? (5×2 = 10)

PART — B

(Maximum marks : 30)

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

1. Explain the behavior of universal gates with logic diagram and truth table.
2. Reduce the expression F = A + B[AC+(B+C')D]
3. Convert $(10110)_2$ to gray code and $(11011)_{gray}$ to binary.
4. Design a half adder with truth table, expressions and logic diagram.
5. Differentiate synchronous and asynchronous sequential circuits.
6. Explain the working of a T-flipflop with logic diagram and truth table.
7. Describe the working of R-2R DAC. (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) Convert the following :

(i) 163.875_{10} to binary

(ii) $4F7.A8_{16}$ to octal

(iii) 2056_{8} to decimal 9

(b) Construct an EX-OR gate using NAND gate. 6

OR

IV (a) Explain about alpha numeric codes with examples. 9

(b) Reduce the expression F = (A + (BC)')' (AB' + ABC) using Boolean algebra. 6

UNIT — II

V (a) Design a full adder with minimum number of gates. 9

(b) Reduce the expression $F(x,y,z) = \Sigma m(0, 1, 2, 3, 6)$ 6

OR

VI (a) Explain the working of a 4 × 1 Multiplexer with diagram. 8

(b) Explain the working of a magnitude comparator. 7

UNIT — III

VII (a) Explain the working of JK Master slave flip flop with logic diagram. 9

(b) Explain the working of 3 bit Johnson counter. 6

OR

VIII (a) Explain the working of a parallel in serial out shift register. 9

(b) Explain the working of 4 bit ring counter. 6

UNIT — IV

IX (a) Explain the working of counter ramp type ADC with diagram. 9

(b) Write notes on error correction codes. 6

OR

X (a) Draw a logic diagram to implement the Boolean function.

F1 = (AB + AC + BC)'

F2 = AB + AC + A'B'C' in PLA 9

(b) Write notes on the following DAC parameters.

(i) Monotonicity (ii) Setting time. 6
