P-24

TED (15) – 3133

(REVISION — 2015)

Reg. No. .....

Signature .....

THIRD SEMESTER DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY — OCTOBER, 2016

DIGITAL COMPUTER PRINCIPLES

(Common for CT and CM)

[*Time* : 3 hours

(Maximum marks : 100)

PART — A

(Maximum marks : 10)

Marks

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

1. State the base of a number system.
2. One's compliment of 1011 is .....
3. Reduce the expression $f(A, B, C) = \Sigma m(0, 1, 2, 3, 4, 5, 6, 7)$.
4. Name the flipflop used for data storage.
5. Name an error detecting code. (5×2 = 10)

PART — B

(Maximum marks : 30)

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

1. Convert 1011 to gray code and gray code 1100 to binary.
2. Map the expression f = A′B′C + AB′C + A′BC′+ ABC′ + ABC.
3. Domonstrate a one bit comparator.
4. Compare sequential and combinational circuit.
5. Draw a 4 bit ring counter using D Flipflop.
6. State the DAC Parameters - Accuracy and Settling time.
7. Draw an internal logic diagram of 32 × 8 ROM.

(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) $(237.25)_{16}$ to Octal

(ii) $(11010011.1111)_2$ to Hexadecimal

(iii) 232.17 to Binary 9

(b) Expand A′ + B′ to min terms and max terms. 6

OR

IV Describe any 7 laws of Boolean Algebra. 15

UNIT – II

V (a) Design a full adder. 9

(b) Reduce the expression $f = \Sigma m\ (0, 2, 3, 4, 5, 6)$ using K-map. 6

OR

VI Demonstrate a 4 bit adder-subtractor with suitable neat diagram. 15

UNIT – III

VII (a) Demonstrate a JK Flipflop with Truth Table. 9

(b) Construct a T Flipflop using a JK Flipflop with Truth Table 6

OR

VIII Demonstrate a 4 bit parallel in serial out shift register. 15

UNIT – IV

IX Explain a weighted resister type DAC. 15

OR

X Draw a logic diagram to implement the Boolean functions.

F1 = AB′ + AC + A′BC′

F2 = (AC + BC)′ in PLA with a PLA programming table. 15