

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/
MANAGEMENT/COMMERCIAL PRACTICE, APRIL – 2024**

DIGITAL COMPUTER PRINCIPLES

[Maximum Marks: **100**]

[Time: **3 Hours**]

PART-A

[Maximum Marks: **10**]

I. (Answer **all** questions in one or two sentences. Each question carries **2** marks)

1. List any two number systems.
2. Draw the symbol of XOR gate.
3. Define don't care condition.
4. Compare latch and flipflop.
5. Define DAC.

(5 x 2 = 10)

PART-B

[Maximum Marks: **30**]

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

1. Convert the following.
 - (i) 1101 to gray code
 - (ii) 0011 to binary code
2. Explain BCD codes.
3. Map the expression $F(A,B,C)=\Sigma(1,3,6,7)$ using KMap.
4. Explain 1-bit magnitude comparator with logic circuit.
5. Distinguish between ring counter and johnson counter.
6. Explain two dimensional decoder.
7. Write short note on Read only memory.

(5 x 6 = 30)

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) $(237)_{16}$ to Octal
- (ii) $(163.875)_{10}$ to Binary
- (iii) $(11011.101)_2$ to Decimal.

(9)

b. Simplify the boolean expression $AB(A+B)(B+B)$.

(6)

OR

- IV. a. Explain any six laws or theorems in boolean algebra. (9)
b. Explain the basic gates with truth table. (6)

UNIT – II

- V. a. Design half adder and draw the logic circuit. (8)
b. Reduce the expression using Kmap, $F(A,B,C,D)=\Sigma(0,1,4,5,13)+d(7,8,9,12,15)$ (7)

OR

- VI. a. Explain binary multiplier with logic diagram. (8)
b. Write short note on SOP and POS forms. (7)

UNIT- III

- VII. a. Explain the working of SR flipflop with truth table and diagram. (8)
b. Explain the working of 3-bit johnson counter. (7)

OR

- VIII. a. Explain the working of JK flipflop with truth table and diagram. (8)
b. Explain the working of SISO shift register. (7)

UNIT - IV

- IX. a. Explain the working of programmable logic array with example. (10)
b. Write notes on Error correcting codes. (5)

OR

- X. a. Explain any four specifications of DAC. (8)
b. Explain the counter type ADC with diagram. (7)
