

TED (15/19) - 3212
(REVISION-2015/19)

A22-06476

Reg.No.....
Signature.....

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/
COMMERCIAL PRACTICE, APRIL - 2022**

DIGITAL CIRCUITS

(Maximum Marks:100)

(Time: 3 Hours)

PART - A

(Maximum marks : 10)

Marks

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

1. What is meant by base of a number system?
2. Define Fan-Out.
3. List two asynchronous inputs.
4. Define Sensitivity of a Digital meter.
5. Define the term Capacity of a Memory.

(5 x 2 = 10)

PART - B

(Maximum Marks: 30)

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

1. Convert
 - (i) $(572)_8 = (\dots\dots\dots)_{16}$
 - (ii) $(34F)_{16} = (\dots\dots\dots)_{10}$
 - (iii) $(72.3125)_{10} = (\dots\dots\dots)_2$
2. Implement AND, OR and NOT gates using NAND gates.
3. With diagram explain the operation of 4 to 1 Multiplexer.
4. Explain the working of D Latch.
5. Describe the working principle of 4 bit Synchronous counter.
6. Explain the operation of binary weighted resistor type DAC.
7. Draw and Explain the circuit of a static RAM cell.

(5 x 6 = 30)

PART - C

(Maximum marks: 60)

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

UNIT - 1

- III (a) Convert the Decimal number (-46), 25 to Binary and ADD using 2's complement method.

(4)

(b) Compute (i) $(A1)_{16} + (6B)_{16}$ (ii) 111×101 (iii) $1001 \div 11$ (6)

(c) Simplify the Logic expression $AB + A(B+C) + B(B+C)$ using linear Algebra (5)

OR

IV (a) Simplify the Boolean Function

. $F(A,B,C,D) = \sum_m(1,3,7,11,15) + \sum_d(0,2,5)$ (6)

(b) Simplify the expression $\overline{AB} + \overline{AC} + \overline{A} \overline{B} C$ using de-Morgan's Theorem (7)

(c) Convert $(11010)_2$ to Gray code (2)

UNIT – 2

V (a) With logic diagram explain the operation of a Full Adder. (8)

(b) With neat diagram explain the operation of NOT gate using TTL (7)

OR

VI (a) Describe the operation of 2-bit Comparator (8)

(b) Describe the operation of 4 bit binary decoder (7)

UNIT – 3

VII (a) Explain the operation of Master Slave JK Flip Flop. (7)

(b) Describe the operation of UP/DOWN asynchronous counter. (8)

OR

VIII (a) Explain the operation of Serial-in-Serial-out Shift Register. (7)

(b) Explain edge triggered SR Flip Flop with help of truth table (8)

UNIT – 4

IX (a) Explain the operation of Successive approximation A/D Converter (8)

(b) Compare RAM and ROM (7)

OR

X (a) Describe about various types of ROM (7)

(b) List various displays in Digital meter. Also define Digital digit and counts, Resolution of Digital meter. (8)

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