TED (15/19) 3042
(Revision-2015/19)

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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/ COMMERCIAL PRACTICE, APRIL - 2025

DIGITAL ELECTRONICS

[Maximum marks: 100]   [Time: 3 Hours]

PART – A
Maximum marks: 10

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

1. Convert binary number 11001010 to octal number.
2. List any two alphanumeric codes.
3. Define fan – out of a gate.
4. Define flip flops.
5. Define resolution and Accuracy of an ADC.   (5 x 2 = 10)

PART – B
Maximum marks: 30

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

1. State and explain De-Morgan's theorems.
2. Design and Implement a Half Subtractor.
3. Draw and explain TTL inverter.
4. Explain the working of a Johnson counter with diagram.
5. Draw the logic circuit of JK flip flop using NAND gates and write the truth table.
6. Explain flash type ADC.
7. Differentiate between synchronous and asynchronous counters.   (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) Perform the following operations.

   (i) 101101+11001   (ii) 11011011÷ 101   (8)

   (b) Construct EX-NOR using NOR gates.   (7)

<div align="center">**OR**</div>

IV. (a) Design a logic circuit by reducing the given expression.

$$F(A,B,C,D) = \sum m(0,1,3,5,9,12,13) + d(2,4,8) \tag{10}$$

(b) List the advantages and disadvantages of K-map. (5)

<div align="center">**UNIT – II**</div>

V. (a) Explain the operation of 4 x 1 multiplexer with logic diagram. (7)

(b) Design a 4 bit gray to binary code converter. (8)

<div align="center">**OR**</div>

VI. (a) Design and Implement a Full Adder circuit. (9)

(b) Define the terms   (i) Noise margin (ii) Noise immunity   (iii) VOH (6)

<div align="center">**UNIT - III**</div>

VII. (a) Draw the diagram and explain the working of Ring counter with truth table. (8)

(b) Draw JK master slave f/f and list the methods for eliminating race around condition. (7)

<div align="center">**OR**</div>

VIII. (a) Explain different types of shift registers. (9)

(b) Explain D and T flip flops. (6)

<div align="center">**UNIT – IV**</div>

IX. (a) Draw and explain 3 bit up down counter. (8)

(b) Discuss the working of 4 bit weighted resistor DAC with neat diagram. (7)

<div align="center">**OR**</div>

X. (a) Explain the Mod-10 asynchronous Counter using JK flip flop. (9)

(b) Explain counter type ADC. (6)

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