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

DIGITAL ELECTRONICS & MICROPROCESSORS

[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. Define the terms nibble and byte in digital electronics.
2. Draw the symbol of positive edge triggered JK flip flop.
3. Name the type of counter used to obtain any customized counting pattern.
4. Write the full form of ALU in µp 8085.
5. List any two special purpose registers in µp 8085. (5 x 2 = 10)

PART – B
Maximum marks: 30

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

1. Perform the following conversions:
   (i) $(2603)_{10}$ to $(\ )_2$ (ii) $(260)_{10}$ to $(\ )_{16}$
2. Define the terms (i) Fan in (ii) Fan Out (iii) Propagation delay
3. Draw the logic diagram of half adder, give expression for sum and carry and write its truth table.
4. State De-Morgan's Theorems. Using this, simplify the expression $\overline{\overline{A + BC} + \overline{A}\overline{B}}$.
5. Mention the application of counters; draw a 3-bit up counter diagram using JK flip-flops.
6. Draw logic diagram & write truth table of a SIPO register using D flip flop to store data 1011.
7. List any six functions of microprocessors. (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) Draw logic symbol, write Boolean expression and truth table of any 4 logic gates. (8)

(b) A number Q = 10010110. What is the decimal value of Q if (i) Q is a binary number (ii) Q is 1's complement of a binary number (iii) Q is 2's complement of a binary number. (7)

OR

IV. (a) Distinguish between TTL, ECL and CMOS logics. (8)

(b) If A = $(11011001)_2$ and B = $(101110)_2$, find (i) A-B (ii) AB (7)

UNIT - II

V. (a) Minimize the following Boolean function – F(A,B,C,D) = $\sum$ m (0, 1, 2, 5, 7, 8, 9, 10, 13, 15) (8)

(b) Draw block diagram, write truth table and implement a 4x1 Mux using basic gates. (7)

OR

VI. (a) Define decoder in digital electronics. Illustrate the working of a 2x4 decoder. (8)

(b) Modify carry logic and implement full adder using two half adders. (7)

UNIT - III

VII. (a) Distinguish between Synchronous & Asynchronous counters. (8)

(b) With a neat diagram explain the working of R-2R ladder type DAC. (7)

OR

VIII. (a) Illustrate the types of shift registers based on data flow using a 4-bit model. (8)

(b) With a neat diagram explain the working of successive approximation type ADC. (7)

UNIT – IV

IX. (a) Draw the architecture of µp 8085. (8)

(b) Write a program to exchange the data at memory locations 5000H & 6000H using µp 8085. (7)

OR

X. (a) List any eight features of µp 8085. (8)

(b) Draw the schematic pinout diagram of µp 8085 (7)
