TED (15/19) – 4032
(Revision – 2015/19)

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Reg.No……………..
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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/ COMMERCIAL PRACTICE, NOVEMBER – 2023

DIGITAL ELECTRONICS AND MICROPROCESSORS

[Maximum Marks : 100] [Time : 3 hours]

PART – A
(Maximum Marks : 10)

Marks

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

1. Find 2's complement of 1010110.
2. State De morgan's theorems.
3. Write any four applications of flip flop.
4. Write any two types of digital to analog converters.
5. Name any two status flag used in 8085 microprocessor. (5x2=10)

PART – B
(Maximum Marks : 30)

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

1. Convert the following
   (i) $(10.625)_{10}$ decimal to binary
   (ii) $(11011.101)_2$ binary to decimal.
2. Apply Demorgan's theorem and simplify the expression

   $\overline{(A\bar{B} + \bar{C}D + EF)}$
3. Draw the circuit of a 4 line to 1 line multiplexer.
4. Explain the term race around condition.
5. Differentiate between synchronous and asynchronous counters.
6. Write short note on interrupts in 8085 microprocessor.
7. Explain any six features of 8085 microprocessor. (5x6=30)

PART – C

(Maximum Marks : 60)

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

UNIT – I

III. (a) Draw the symbol and truth table of the following logic gates.
(i) AND (ii) OR (iii) NOT (iv) NAND (v) NOR (vi) EX-OR (6)

(b) Convert the following
1. $(86.45)_{10}$ decimal into octal
2. $(28.A2)_{16}$ hexadecimal into decimal
3. $(61.625)_{10}$ decimal into binary (9)

OR

IV. (a) Explain the following
(i) Propagation delay (ii) Power dissipation (iii) speed power product (iv) fan out (8)

(b) Explain the advantages and disadvantages of TTL gates and CMOS gates. (7)

UNIT – II

V. (a) Explain the implementation of full adder using half adders. (7)

(b) Using K map minimize the following Boolean function
$f(A,B,C,D)=\sum m(1,2,4,5,7,8,9,10,13,15)$ (8)

OR

VI. (a) Minimize the expression $f(ABC) = ABC + AB\bar{C} + A\bar{B}C + \bar{A}BC + A\bar{B}\bar{C}$ using K map.
Also verify the result using Boolean algebra. (8)

(b) With neat figure explain working of a Master Slave JK flip flop. (7)

UNIT –III

VII. (a) Draw and explain a serial in serial out (SISO) shift register. (7)

(b) Discuss in detail about mod-8 ripple counter and draw its timing diagram. (8)

OR

VIII. (a) Explain 4 bit (mod - 16) asynchronous up counter with logic and timing diagram. (9)

(b) Explain the operation of R-2R ladder type DAC using neat diagram. (6)

UNIT – IV

IX. (a) Discuss in detail about various addressing modes of 8085 microprocessor with example. (6)

(b) Sketch and explain the functional block diagram of 8085 microprocessor. (9)

OR

X. (a) Draw and explain pin diagram of 8085. (9)

(b) Write short note on flag registers of 8085 microprocessor. (6)

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