TED (15) – 4032

(REVISION — 2015)

Reg. No. ....

Signature ....

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE — OCTOBER, 2019

DIGITAL ELECTRONICS & MICROPROCESSORS

[*Time* : 3 hours

(Maximum marks : 100)

PART — A

(Maximum marks : 10)

Marks

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

1. Define radix and radix point.

2. State and prove De Morgan's theorem.

3. What is Karnaugh map ?

4. Define modulo –n counter.

5. List the Special Purpose Registers (SPR) used in 8085 microprocessor. $(5 \times 2 = 10)$

PART — B

(Maximum marks : 30)

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

1. Realize the logic expression $Y = \overline{B}\,\overline{C} + \overline{A}\,\overline{C} + \overline{A}\,\overline{B}$ using basic gates.

2. List any six different performance parameters and characteristics of logic families.

3. Design and explain a full adder circuit using XOR, AND & OR gates.

4. Justify the JK flip - flop as a universal flip flop.

5. Draw and explain the block diagram of SISO shift register.

6. List any six applications of counters.

7. Explain the instruction format of 8085 microprocessor. $(5 \times 6 = 30)$

[92]

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PART — C

(Maximum marks : 60)

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

Marks

Unit — I

III (a) (i) Convert $(4ECE.43F)_{16}$ to octal number.

   (ii) Convert the decimal number 46.2 into binary number. 8

   (b) Draw the symbols and truth tables of the following logic gates.

   (i) OR   (ii) AND   (iii) NOT   (iv) NAND

   (v) NOR   (vi) XOR   (vii) XNOR 7

Or

IV (a) Implement the logic gates for the following expressions.

   (i) $(A + B)(C + D + E)$ (ii) $(A + B + \overline{C})(D + \overline{E})$ 8

   (b) Explain the general classification of logic families. 7

Unit — II

V (a) State and prove the basic theorems of Boolean algebra. 8

   (b) Construct and explain the logic circuit for 4 to 1 line multiplexer. 7

Or

VI (a) Explain the operation of encoders and decoders. 8

   (b) Describe the working of master slave JK flip flop. 7

Unit — III

VII (a) Compare between combinational circuits and sequential circuit. 8

   (b) Draw and explain a 3 bit Up - Down synchronous counter. 7

Or

VIII (a) Explain the working of the following ADC's with block diagram.

   (i) Successive approximation ADC   (ii) 3 bit flash ADC 8

   (b) Draw and explain the four bit Parallel In - Serial Out shift registers constructed by D - flip-flops and NAND gates for entering data. 7

Unit — IV

IX (a) Draw the pin diagram of 8085 and explain the function of each pin. 8

   (b) Explain any seven features of 8085 microprocessor. 7

Or

X (a) Draw and explain the functional block diagram of 8085 microprocessor. 8

   (b) Explain various addressing modes of 8085 microprocessor with justification. 7

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