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(Revision – 2015/19)

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Reg. No……
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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE, NOVEMBER – 2024

DIGITAL COMPUTER PRINCIPLES

[Maximum Marks: **100**] [Time: **3** Hours]

PART-A

[Maximum Marks: **10**]

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

1. Define base or radix of a number system.
2. What is minterm?
3. Define sequential circuit.
4. List two applications of counter.
5. What is ROM? (5 x 2 = 10)

PART-B

[Maximum Marks: **30**]

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

1. What are the advantages of digital system?
2. With the help of symbol and truth table explain the working of AND, OR and NOT gates.
3. Describe minimization steps of SOP and POS expressions using K- map.
4. Draw and explain a full adder.
5. Explain the working of JK FF with a neat diagram.
6. With a neat diagram explain the working of ring counter.
7. Explain the specifications of DAC. (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. Convert the following numbers

(i) $(48)_{10}$ = (……)$_2$ (ii) $(9AF)_{16}$ = (……)$_2$

(iii) $(150)_{10}$ = (……..)$_{16}$. (iv) $(378)_{10}$ = (……..)$_8$ (8)

b. Simplify the Boolean expression f = (B+BC)(B+B'C)(B+D). (7)

OR

IV. a. With the help of logic diagram and truth table, verify De Morgan's theorems. (8)

b. Explain various number systems. (7)

UNIT – II

V. a. Simplify the given expression using K- map f = Σm (0,1,2,3,5,7,8,9,10,12,13). (8)

b. Explain the working of 4 input multiplexer? (7)

OR

VI. a. Draw and explain 3 line to 8 line decoder. (9)

b. What are the advantages and disadvantages of K map. (6)

UNIT- III

VII. a. With a neat diagram explain the working of master slave JK Flip-Flop. (9)

b. Draw and explain the working of serial in serial out shift right, shift register. (6)

OR

VIII. a. Draw and explain 3 - bit ripple up counter. (9)

b. Explain race around condition. (6)

UNIT - IV

IX. a. Draw and explain the working of R-2R ladder type DAC. (8)

b. With the help of neat diagram explain the working of PLA (7)

OR

X. a. With a schematic diagram explain the working of ADC. (8)

b. With the neat diagram explain the working of PAL. (7)

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