PD - 174

M.Sc. COMPUTER SCIENCE (FIRST SEMESTER)

Examination- DEC.-2020

Compulsory/Optional

Group -

Paper-

Name/ Title of Paper- DIGIATAL ELECTRONICS AND MICROPROCESSOR

Time:- Three Hours] **[Maximum Marks:80**

नोट : दोनो खण्डों से निर्देशानुसार उत्तर दीजिए। प्रश्नों के अंक उनके दाहिनी ओर अंकित है।

Note: Answer from Both the Section (A&B)as Directed. The Figures in the right-hand margin indicate marks.

Section – A

1. Choose the correct option: **1X10=10**

(a) A MOSFET is sometimes called ..... JFET.
- (i) Many gate
- (ii) Open gate
- (iii) Insulated gate
- (iv) Shorted gate.

(b) When drain voltage equals the pinch-off-voltage, the drain current ..... With the increase in drain voltage.
- (i) Decreases
- (ii) Increases
- (iii) Remain constant
- (iv) Lone of the above.

(c) It a digital system that uses N-bits can go through.
- (i) N-counts
- (ii) 2N-counts
- (iii) 2^N-counts
- (iv) 2^N-1-counts.

(d) For the function F(A,B,C) = $A\bar{B}'C+\bar{A}BC+A\bar{C}$, how many 1s are in the truth tables output column.
- (i) 2
- (ii) 3
- (iii) 4
- (iv) 5

(e) In K-map simplification a group of four adjacent is levels to a term with.
- (i) One literal less than the total number of variables.
- (ii) Four literal less than the total number of variables.
- (iii) Three literal less than the total number of variables.
- (iv) Two literal less than the total number of variables.

(f) To get excess-3 code from BCD code.
- (i) 0110 is substracted
- (ii) 0011 is substracted
- (iii) 0011 is added
- (iv) 0110 is added.

(g) A modulus-12 ring counter requires a minimum of ..... .
- (i) 10 Flip-flops
- (ii) 12 Flip-flops
- (iii) 6 Flip-flops
- (iv)2 Flip-flops

(h) In a sequential circuit, the output at any instant depends on.
   (i) Present Inputs
   (ii) Previous outputs
   (iii)Previous Inputs and present outputs.
   (iv)Previous output and present Inputs.

(i) The part of machine level instruction, which tells the processor what needs to be done is.
   (i) Op code
   (ii) Address
   (iii)Operand
   (iv) None of the above.

(j) The program counter (PC)/ instruction pointer in a microprocessor.
   (i) Counts the number of programs being executed
   (ii) Counts the number of instructions being executed
   (iii) Counts the number of stack instructions being executed
   (iv) Keeps the address of the next instruction to be fetch.

2. Write short notes on the following. **2X5**
   (i) Decodes
   (ii) Canonical and standard forms of Boolean expressions.
   (iii) Excitation table of Flip-Flops.
   (iv) Family of microprocessor.
   (v) JK Flip Flop.

Section – B

Answer all the questions. **5X12**

UNIT - I

3. Discus the electrical characteristics of logic families.

OR

How Diode and Transistor are used as switch? Explain your answer.

UNIT - II

4. Simplify the following boolean function using K-map method.
   $F(A,B,C,D) = \Sigma (0,1,3,4,7,8,12,14)$
   $d(A,B,C,D) = \Sigma(2,9,11,15)$

OR

Discus the Boolean postulates and properties in detail.

UNIT - III

5. Design BCD to excess-3 code converter?

OR

Explain the function of the following.
(i) Multiplexer
(ii) De Multiplexer
(iii)Encoder
(iv)Full subtractor.

UNIT - IV

6. Discuss different types of Flip-flops in detail.

OR

Draw and discuss the UP/Down counter in detail.

UNIT - V

7. Explain the different addressing modes of 8086 microprocessor using suitable examples.

OR

Draw and discuss the internal architecture of 8086 microprocessor in detail.