

Time:- Three Hours]

[Maximum Marks:80

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

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) None 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 $F(A,B,C) = \overline{A}B'C + \overline{A}BC + A\overline{C}$, 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 subtracted
- (ii) 0011 is subtracted
- (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. Discuss 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

Discuss 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.