**Course Code : CST 214** **EVFU/MW – 18 / 6019**

# Third Semester B. E. (Computer Science and Engineering) Examination

## DIGITAL CIRCUITS AND FUNDAMENTALS OF MICROPROCESSOR

Time : 3 Hours ] [ Max. Marks : 60

**Instructions to Candidates :—**

(1) All questions carry equal marks.
(2) Assume suitable data wherever necessary.
(3) Illustrate your answers wherever necessary with the help of neat sketches.

1. Solve any **Two** :—

(a) Explain the following terms with the help of example :—

(i) Implicants

(ii) Prime Implicants

(iii) Essential Prime Implicants. 5 (CO 1)

(b) Find which two numbers are equal :—
$(125715)_{10}$ , $(1111111011111110)_2$ , $(ABCD)_{14}$ , $(177376)_9$ , $(FEFE)_{16}$

5 (CO 1)

(c) Simplify the following expression using K – map :—
$F = \sum m (0 , 1 , 2 , 5 , 8 , 9 , 10 , 12 , 13 , 14 , 16 , 17 , 18 , 21 , 22 , 24 , 25 , 26 , 28)$

5 (CO 1)

2. Solve any **Two** :—

(a) What do you mean by decoder ? Implement BCD to 7 segment convertor using decoder and OR gates. 5 (CO 2)

(b) Design 4 bit Gray to Binary code convertor. Draw the circuit diagram for this. 5 (CO 2)

(c) Perform the BCD operation on following numbers :—

(i) 2905 + 1897

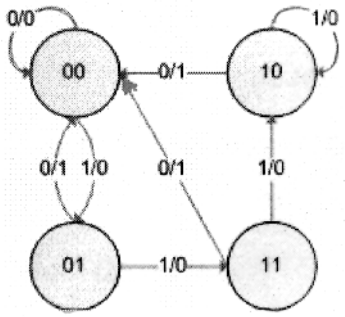
(ii) 3250 – 72532 (using 9's complement mehtod) 5 (CO 2)

3. Solve any **Two** :—

(a) What do you mean by Race around condition ? Give and Explain solution to it. 5 (CO 3)

(b) What do you mean by Excitation table ? Convert D flipflop to JK flipflop using excitation table. 5 (CO 3)

(c) Derive the sequential circuit for the following state diagram using T Flipflop :—




5 (CO 3)

4. Solve any **Two** :—

(a) Differentiate between Synchronous and Asynchronous Counter. Design asynchronous decade counter. 5 (CO 3 , 4)

(b) Design a synchronous counter for 2421 number system code. 5 (CO 3 , 4)

(c) What do you mean by shift register ? Discuss bidirectional shift register in detail. 5 (CO 3 , 4)

5. Solve any **Two** :—

(a) Explain the following terms :—

(i) PROM (ii) PLD (iii) Flash Memory 5 (CO 4)

(b) Distinguish between Static RAM and Dynamic RAM. Design 8 x 2 RAM using 4 x 4 RAM. 5 (CO 4)

(c) Design PLA for the following function :—

$F1 = \pi M (0 , 1 , 5 , 7 ) , \ F2 = \pi M (0 , 1 , 2 , 6 ) , \ F3 = \pi M (2 , 3 , 4 )$

5 (CO 4)

6. (a) Explain the following instructions with an example with respect to 8085 microprocessor :—

(i) JNC

(ii) RAL

(iii) DAA

(iv) XCHG

(v) XRI 10 (CO 4)

(b) Two digit number is stored at memory location 4200H. Unpack the number and store two digits in memory location 4300H and 4301H such that 4300H will contain least significant digit of number. 5 (CO 4)