Roll No. ....

3092

B. Tech. 4th Semester (ECE)
Examination – July, 2021

DIGITAL ELECTRONICS

Paper : PCC-ECE-205-G

Time : Three hours]   [Maximum Marks : 75

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Question No. 1 is **compulsory**. Attempt any **one** from each Section.

1. (a) Find the hex sum of $(93)_{16} + (DE)_{16}$. $2.5 \times 6 = 15$

   (b) Differentiate between latch and flip flop.

   (c) Why NAND-NAND realization is preferred over AND-OR realization ?

   (d) What is Race around condition ?

   (e) Realize OR gate using universal gates.

   (f) What is programmable logic array ? How it is differs from ROM ?

SECTION – A

2. (a) Reduce by K-mapping and implement using NOR-NOR logic :   10

$$y = \sum m\,(1,2,3,4,6,7,10,11,13,14)$$

(b) Find 9's complement and 10's complement of 155 and 255.   5

3. (a) State and prove De-Morgan's theorem.   5

(b) What is Quine McCluskey method ? Use QM method to reduce each following expression to a minimum SOP form :   10

(i) $y = \overline{ABCD} + \overline{ABC}D + ABCD + ABC\overline{D}$

(ii) $y = \overline{AB}(\overline{CD} + \overline{C}D) + AB(\overline{CD} + \overline{C}D) + A\overline{BCD}$

SECTION – B

4. (a) Perform each of the following conversions :   10

(i) $(11010)_2 = (\quad)_{BCD}$

(ii) $(10111011)_2$ into its equivalent grey code.

(b) Determine the single error correcting code for the information code 10111 for odd parity.   5

5. (a) Implement the function $F(x, y, z) = \Sigma(1, 2, 6, 7)$ using 4×1 Multiplexer.   10

(b) Explain full adder circuit in detail.   5

SECTION – C

6. (a) Convert the following :   10

       (i) SR Flip flop into JK Flip flop

       (ii) JK Flip flop into D Flip flop

   (b) Write short note on Edge triggered Flip flop.   5

7. (a) Explain working of serial in serial out shift register.   10

   (b) Design MOD-10 synchronous counter with JK-Flip flop.   5

SECTION – D

8. What is FSM ? Describe types of FSM. Mention advantages, disadvantages and applications for the same.   15

9. Compare PAL and PLA. Also draw combinational circuit for a PLA with three inputs, three product terms and two outputs.   15

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