

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) $y = \overline{ABCD} + \overline{AB}CD + ABCD + ABC\overline{D}$
- (ii) $y = \overline{A}B(\overline{C}D + \overline{C}D) + AB(\overline{C}D + \overline{C}D) + A\overline{B}CD$

SECTION - B

4. (a) Perform each of the following conversions : 10
- (i) $(11010)_2 = ()_{BCD}$
- (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

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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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