(Pages : 2)

F – 2212

Reg. No. : .....

Name : .....

Third Semester B.Tech. Degree Examination, December 2018
(2008 Scheme)
08.306 : DIGITAL ELECTRONICS (T)

Time : 3 Hours Max. Marks : 100

PART – A

Answer **all** questions in Part **A**. **Each** question carries **4** marks.

1. State and prove DeMorgan's theorem.
2. Obtain the canonical sum of product form of the function Y = A + BC.
3. Write the VHDL code for a Half adder.
4. Differentiate static RAM from that of a dynamic RAM.
5. Show that a positive logic NAND gate is negative logic NOR.
6. Construct a JK flip flop using D and T flip flops.
7. What is a shift register ? Draw the universal shift register.
8. Differentiate Moore model from that of a Mealy model.
9. Draw the basic structure of an asynchronous sequential circuit.
10. Define static 0 and static 1 hazard. **(10×4=40 Marks)**

P.T.O.

PART – B

Answer **any 2** questions from **each** Module. **Each** question carries **10** marks.

Module – I

11. Reduce the following Boolean function using Quine-Mccluskey method

    $F(A, B, C, D) = \sum m\ (0, 1, 2, 3, 4, 6, 8, 10, 12, 14)$ **10**

12. Explain how you will build a 64 input MUX using nine 8 input MUXs. **10**

13. Write the VHDL code for a Full Adder. **10**

Module – II

14. Draw and explain the circuit of two input CMOS NAND gate. **10**

15. Elucidate how the flip flop timing specifications are important from its design point of view. **10**

16. Using JK type design, design a synchronous counter for
    $0 \rightarrow 7 \rightarrow 5 \rightarrow 6 \rightarrow 1 \rightarrow 2 \rightarrow 0 \ldots$ **10**

Module – III

17. Design a sequence detector to detect the sequence 1101 with JK flip flops. **10**

18. Explain how essential hazards and static hazards are eliminated. **10**

19. Draw the logic diagram of the product of sums expression $Y = (X_1 + \overline{X}_2)(X_2 + X_3)$. Show that there is a static 0 hazard when X_1 and X_3 are equal to 0 and X_2 goes from 0 to 1. Find a way to remove the hazard by adding one more OR gate. **10**