DIGITAL ELECTRONICS

Time : 3 Hours]   [Total Marks: 80

_____

PART-A

3X10=30

Instructions   :   1. Answer **All** questions.

2. Each question carries THREE marks

3. Answer should be brief and straight to the point

1. Convert the following binary numbers into Hexa decimal numbers

   (a) 10111011   (b) 11010.101

2. Draw the symbols of AND, OR and NOT gates.

3. State De-Morgans theorems.

4. Define the following characteristics of digital logic families.

   (a) Fan-in (b) Propagation delay

5. Give the truth table for full adder.

6. State the need for Tri-state buffer.

7. Draw the logic diagram of NAND latch and Give the truth tables.

8. Write any three differences between asynchronous and synchronous sequential

   circuits.

9. State the need for a register.

10. List the different types of memories.

PART-B

Instructions : 1. Answer any **five** questions.

2. Each question carries **ten** marks.

3. Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer

11. Simplify the following expression with the karnaugh map and obtain logic implementation for the resulting expression.

$X = \bar{A}\,\bar{B}\,\bar{C}\,\bar{D} + \bar{A}\,\bar{B}\,\bar{C}\,D + ABCD + ABC\bar{D}$

12. Realize the basic gates using NAND and NOR gates only.

13. Draw CMOS NAND gate circuit and explain its working.

14. Draw and explain a 4-bit parallel binary adder with suitable example.

15. Draw and explain the logic circuit of a 4 x 1 multiplexer with truth table.

16. Draw the logic circuit of a clocked D-Flip-Flop and explain its operation with timing diagram.

17. Explain the working of 4-bit bidirectional shift register with a logic circuit.

18. (a) Draw the logic diagram of 4-bit ring counter.

(b) Write the differences between static and dynamic memories.

*****