Question Bank (G scheme)

Name of subject: DIGITAL TECHNIQUES **Unit Test: I**

Subject Code: 17333 **Courses: CM3G/IF**

Semester: III

CHAPTER 1: Introduction to Digital Techniques (16 marks)

3 marks

1) Which are the advantages of digital circuits?

2) convert the following hexadecimal number into binary: (AFB2)16

3) Explain the following terms noise margin, power dissipation, propagation delay

4) Explain fan-out, fan-in and figures of merit

5) convert the following binary number to decimal number: (1011.01)2

6) Perform (9)10-(4)10 using 1's complement method

4 marks

7) Perform the following subtraction using 2's complement method:

(11010)2 - (10000)2

8) Write down the characteristics of CMOS.

9) Perform BCD addition for the following:

i) (85)10 + (39)10 or

ii) (368)10 + (427)10

CHAPTER 2: Logic gates and Boolean algebra (18 marks)

3 marks

1) Write down any six Boolean laws.

2) Explain principle of duality theorem.

4 marks

3) Prove the following logic expression using Boolean algebra:

i)(A+B)(A+C)=A+BC

ii) $A+\overline{A}B=A+B$

4) Write down the truth table, logic symbol and Boolean expression for AND gate using 3 inputs.

5) Write down the truth table, logic symbol and Boolean expression for EX-OR gate using 2 inputs.

ii) $Y=AD+\overline{B}CD+B\overline{C}D$

6) Draw the equivalent circuit of the following gates using NAND gates

i) OR ii) AND

7) Draw logic circuit using universal gates for following logic equation:

$Y=\overline{A}BC+A\overline{C}+\overline{B}C$

8) Explain EX-OR Gate and EX-NOR Gate.

9) Simplify given expression and draw circuit diagram using only NOR Gate.

$Y=\overline{A}BC+\overline{B}C+A\overline{B}C+AB\overline{C}$

10) Prove that

$(A+B+C)(A+B+\overline{C})(A+\overline{B}+C)(A+\overline{B}+\overline{C})=A$

CHAPTER 3: Combinational logic circuit. (26 Marks)

Mark 3:

1) Simplify Boolean expression.

$Y=\sum m(2, 4, 6)$

2) Drawhalf adder circuit using k map and realize it by using basic gates.

Mark 4:

3) Draw full adder circuit using k map and realize it by using basic gates.

4) Draw 4:1 mux. And give its truth table.

5) Implement 16:1 Mux using 4:1 Mux.

6) Implement the following expression using multiplexer $Y=\sum m(0, 1, 2, 3, 6, 7)$.