

GUJARAT TECHNOLOGICAL UNIVERSITY**MCA – SEMESTER - I • EXAMINATION – WINTER 2012****Subject code: 2610004****Date: 07/01/2013****Subject Name: Fundamental of Computer Organization (FCO)****Time: 02:30 pm – 05:00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1 (a)** Do as Directed
- i. Convert $(444)_{10}$ into Binary, Octal and Hexadecimal **03**
 - ii. Define terms Instruction, Assembler, mnemonics **03**
 - iii. List Basic components of a Digital Computer **01**
- (b)** Do as Directed
- (i) Write the first 25 numbers in a base 11 number system using the digits 0,1,2,3,4,5,6,7,8,9, and A to express the 25 numbers that you write (Decimal 10 = A, for Instance). Note: Starting number will be 0. **03**
 - (ii) Simplify the following expressions using Boolean Algebra rules **02**
 $A(A+B+C) (A'+B+C) (A+B'+C) (A+B+C')$
 - (iii) List out Arithmetic and Logical Instructions of 8086 **02**
- Q.2 (a)** What type of RAM is DRAM? Explain individual cell Composed of what, Pin-out, and Address timing for 64K dynamic memory. **07**
- (b)**
- i. Explain working of MUL Instruction. **03**
 - ii. Why FULL-ADDER is required? Explain with example **04**
- OR**
- (b)**
- i. Describe different types of buses. **03**
 - ii. Explain Zero address Instruction with example. **04**
- Q.3 (a)** Simplify the Boolean function in sum-of-products form by means of a 4-variable map. Draw the logic diagram with (a) AND-OR gates (b) NAND-NAND gates **07**
 $F(A,B,C,D) = \sum m(0,1,2,4,5,8,10,11,14,15)$
- (b)** What is Flip-flops? Explain in detail. **07**
- OR**
- Q.3 (a)** What is a Binary Counter? Write a note on asynchronous Binary counter with necessary figures. **07**
- (b)** Simplify the Boolean function in product-of-sums form by means of a 4-variable map. Draw the logic diagram with (a) OR-AND gates (b) NOR-NOR gates **07**
 $F(A,B,C,D) = \prod M(0,2,3,6,7,8,9,10,12,13)$
- Q.4 (a)** What do you mean by Addressing Techniques? Explain DIRECT and INDIRECT Addressing techniques with an example. **07**
- (b)** Explain ROM. Construct Diode ROM and with four input lines and four output lines. Also show Combinational network for binary to Gray – Code. **07**
- OR**
- Q.4 (a)** What do you mean by Instruction cycle and Execution cycle? Explain organization of control registers for Instruction Cycle and Execution Cycle with diagram. **07**
- (b)** Draw Timing signal for asynchronous transfer, synchronous transfer. **07**
- Q.5 (a)** Explain Execution Unit of 8086 Microprocessor. Draw Block diagram **07**
- (b)** Write a note on Instruction format of Microprocessor 8086 **07**
- OR**
- Q.5 (a)** Explain Bus Interface Unit of 8086 Microprocessor. Draw Block Diagram **07**
- (b)** Write a note on various types of Printer. **07**
