

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA – SEMESTER – I • EXAMINATION – SUMMER 2018

Subject Code: 3610004

Date: 28-May-2018

Subject Name: Fundamentals of Computer Organization

Time: 02.30 pm to 5.00 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 and Hexadecimal **02**
 - ii. 1's and 2's Complement **02**
 - iii. Simplify the following expressions using Boolean Algebra rules **03**
 $A(A+B+C) (A'+B+C) (A+B'+C) (A+B+C')$
- (b) Define following term** **07**
- i. Immediate Addressing
 - ii. Direct Addressing
 - iii. Relative Addressing
 - iv. Indirect Addressing
 - v. De Morgan's Law
 - vi. Instruction Cycle
 - vii. Excess-3
- Q.2 (a) Explain the Full adder with circuit diagram and truth table** **07**
- (b) What is Flip-flops? Explain type of Flip-Flop** **07**
- OR**
- (b) Write a note on Key board.** **07**
- 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) i. Subtract 111001 from 1110001. **02**
 - ii. Subtract 11100 from 10011 using 2's complement. **02**
 - iii. Add 647 and 482 in BCD. **03**
- 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) Explain basic working and application of Multiplexer in detail.** **07**
- (b) Write the codes for decimal numbers with example.** **07**
- OR**

- Q.4 (a) Explain the difference between SRAM and DRAM. **07**
(b) What is Multiplexer? Explain working of 4 to 1 line multiplexer using appropriate diagram. **07**
- Q.5 (a) What is Decoder? Explain working of 3 to 8 decoder with necessary diagram and table. **07**
(b) Explain Execution unit of 8086 Microprocessor. Draw block Diagram. **07**
- OR**
- Q.5 (a) Write short note on basic components of a digital computer. **07**
(b) Write a note on various types of Printer. **07**

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