

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**MCA– SEMESTER –I EXAMINATION –SUMMER-2019**

**Subject Code: 3610004****Date: 21-05-2019****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)** Answer the following questions: **07**
1. Explain basic duality of Boolean algebra.
  2. Convert  $(1001011)_2$  into gray code.
  3. What is self-complementary code?
  4. Write De-Morgan's Law.
  5. Define Subcube.
  6. Differentiate RAM and ROM.
  7. Write basic symbols of Quinary number system.
- (b)** Answer the Following Questions: **07**
1.  $(1762.46)_8 = (\text{_____})_2$
  2.  $(10011100)_2 = (\text{_____})_{10}$
  3.  $(1010.101)_2 + (110.01)_2 = (\text{_____})$
  4. \_\_\_\_\_ are the weights of the BCD number.
  5.  $(111010001)_2 = (\text{_____})_{16}$
  6. Complement of  $(xy + x'y')$  = \_\_\_\_\_
  7. Gray code 1101110 =  $(\text{_____})_2$
- Q.2 (a)** What is a computer? Explain major components of a digital computer. **07**
- (b)** Write a short note on Peripheral devices. **07**
- OR**
- (b)** Write a note on Magnetic storage devices. **07**
- Q.3 (a)** Write a note on 3 bit asynchronous binary counter. **07**
- (b)** Explain 1-bit binary Full Adder in detail. **07**
- OR**
- Q.3 (a)** Write a note on Multiplexer **07**
- (b)** What is a sequential logic circuit? Explain it with a 3 bit shift register. **07**
- Q.4 (a)** What do you mean by addressing techniques? Explain Indirect and Indexed addressing techniques with proper examples. **07**
- (b)** Explain Instruction cycle and Execution cycle in detail. **07**
- OR**
- Q.4 (a)** Explain Immediate addressing, Direct addressing and Register addressing techniques. Also compare them with appropriate examples. **07**
- (b)** List three different types of bus and explain how three state drivers are used in the interfaces of buses. Also draw timing signals for asynchronous transfer. **07**
- Q.5 (a)** 1.  $ABCD + A'BC'D' + A'BC'D + A'BCD'$ . Simplify without using K-Map **03**  
and draw a combinational network using NAND gate only. **04**

2. Draw k-map for:  $ABC + ABC + ABC + ABC + ABC$  (consider last three terms as Don't-cares terms) and simplify the expression. Draw the circuit diagram for the expression using only NAND gates.
- (b) Explain Execution Unit of 8086 microprocessor in detail with appropriate diagram. **07**

**OR**

- Q.5** (a) Explain following instructions of 8086 microprocessor: **07**  
CMP , XOR , NEG , SUB , INC , NOT , AND
- (b) 1. De Morganize the given Boolean expression: **03**  
 $[(A+B) \cdot (C+D)] \cdot [(E+F) \cdot (G+H)]'$
2. Simplify the Boolean function  $F(A,B,C,D) = \pi(0,2,4,6,8,10,12,14)$ , using **04**  
K-Map and draw a combinational logic circuit

\*\*\*\*\*

GTUQuestionPapers.com