

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA - SEMESTER- 1 EXAMINATION – WINTER 2018

Subject Code: 3610004

Date: 08-01-2019

Subject Name: Fundamentals of Computer Organization

Time: 10.30 am to 1.00 pm

Total Marks: 70

Instructions:

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

- Q.1 (a) Do as directed :**
1. Convert decimal number(0.6875) to binary number **01**
 2. Convert binary 0.001101 to decimal. **01**
 3. What is mean by BCD ? Explain with example **02**
 4. $10110 - 1011$ **01**
 5. 1101.11×101.1 **01**
 6. $11110 / 101$ **01**
- (b) Do as directed :**
1. Network Adapter **01**
 2. USB Port **01**
 3. Light pen **01**
 4. What is mean by bistable device? explain with example **01**
 5. List De Morgan's theorems **01**
 6. Where does complements are used? Compare 1's complement with 2's complement. **02**
- Q.2 (a) Simplify the following Boolean Expressions: 07**
- a. $A + B[AC + (B + C')D]$
 - b. $(A + B'C)' (AB' + ABC)$
- (b) Briefly explain the working of any three peripheral devices. 07**
- OR**
- (b) Write a short note on different categories of Printers. 07**
- Q.3 (a) Design and explain binary counter to count from 0 to 7.. 07**
- (b) Write note on 8×1 multiplexer. 07**
- OR**
- Q.3 (a) Explain shift register with wave form and circuit diagram. 07**
- (b) Explain Full adder in detail. 07**
- Q.4 (a) Explain working of following instructions with example 07**
1. MOV
 2. OR
 3. CMP
 4. NEG
- (b) What is Flip-flop? Draw and explain the logic diagram and characteristics table of RS flip flop 07**
- OR**
- Q.4 (a) Draw the structure of 8086 execution unit and explain it. 07**
- (b)**
1. Implement the Boolean function $F = xy + x'y' + y'z$ using logic gates. **02**
 2. Simplify the following Boolean function:
 $F = A'B'C' + B'CD' + A'BCD' + AB'C'$ **05**
- Q.5 (a) Explain the interface of different buses with processor, memory and I/O devices. 07**

- (b) Simplify the following Boolean function: $F(w,x,y,z) = \Sigma(0,1,2,4,5,6,8,9,12,13,14)$ and draw the circuit diagram using of derived Boolean function using NAND gate only. **07**

OR

- Q.5 (a)** What do you mean by Addressing Techniques? Explain the direct, relative and indexed addressing techniques with an example. **07**
- (b) 1. Prove by perfect induction method $(A + B) + C = A + (B + C)$ **04**
2. Define distributive law and prove any one **03**
