

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA - SEMESTER- 1 EXAMINATION – WINTER 2018

Subject Code: 2610004

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 marks.

- Q.1 (a) Do as Directed. 07**
- (1) “CPU is brain of Computer” – Justify.
 - (2) State truth table for NOR gate.
 - (3) State major components of a typical digital computer.
 - (4) What is the Base of Binary number system and Hexadecimal Number system?
 - (5) $(1010100.01)_2 - (110000.10)_2 = \underline{\hspace{2cm}}$.
 - (6) Derive dual of $X.(X' + Y) = X.Y$
 - (7) State difference between RAM and ROM.
- (b) Write a short note on following : 07**
- (1) Scanner
 - (2) RS flip flop
- Q.2 (a) Do as Directed. 07**
- (1) Convert $(ACD1)_{16}$ into Octal Number. Specify the steps you use for conversion.
 - (2) $(10001)_2 - (11100)_2$ using 1's compliment method.
 - (3) What is Karnaugh map?
 - (4) Convert decimal Number (201) into Octal number.
 - (5) How can you use complement to represent a negative number? Give an example.
 - (6) Perform : $209.7 - 181.2$ using 9's complement method.
 - (7) Convert $(101101111010)_2$ to its equivalent hexadecimal number.
- (b) Explain Indirect and Relative Addressing mode with suitable example. 07**
- OR**
- (b) Explain working of 3-bit counter. 07**
- Q.3 (a) Write a Boolean expression SOP form for a 3-input A,B,C gating network that will have outputs 1 for designation m0, m1, m3, m6 and m7 and the outputs are 0 for designation m2, m4 and m5. Draw two level NAND to NAND gate combination network for SOP that corresponds to the simplified expression. 07**
- (b) Explain design of Full – Adder. 07**
- OR**
- Q.3 (a) What is Flip-Flop? Explain how a JK Flip Flop is made from an RS Flip Flop. 07**
- (b) What is universal gate? Which gates are known as universal gate? Explain with Reason, use any one such gate as universal gate. 07**
- Q.4 (a) What is a Multiplexer? Explain 4-to-1 line multiplexer. 07**

- (b) What is Bus? Explain Address Bus, Data Bus and Control Bus. 07
- OR**
- Q.4 (a) Explain Direct and Indexed Addressing mode with suitable example. 07
- (b) What is Cache memory and Virtual memory? Explain in detail. 07
- Q.5 (a) Describe zero-address and two-address instruction word formats. 07
- (b) Explain working of ADD, SUB and NOT instructions with example. 07
- OR**
- Q.5 (a) Explain Instruction and Execution Cycle. 07
- (b) Explain instruction format of 8086 microprocessor. 07
