

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA - SEMESTER-I • EXAMINATION – SUMMER • 2014

Subject Code: 2610004

Date: 20-06-2014

Subject Name: Fundamentals of Computer Organization

Time: 10:30 am - 01:00 pm

Total Marks: 70

Instructions:

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

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|-----------|--|---|----|
| Q.1 | (a) | 1. Prepare a truth table for Boolean expression: (i) $A(BC' + B'C)$ (ii) $X+YZ'$ | 02 |
| | | 2. List out first 30 numbers of base 20 number system | 02 |
| | | 3. i) Convert $(0.6875)_{10}$ to binary. | 03 |
| | | ii) Convert $(1010.011)_2$ to decimal. | |
| | | iii) iv) Convert $(A87)_{16}$ to its equivalent octal number | |
| (b) | Perform the following operations: | | |
| | 1. $0001 - 1000$ (Using 2's complement system). | 01 | |
| | 2. Explain Visual Display Unit. | 04 | |
| | 3.. Convert following: $(252)_{10} = (\quad)_2 = (\quad)_8 = (\quad)_{16}$ | 02 | |
| Q.2 | (a) | State the De Morgan's theorems and Explain. Which are the universal gates? Describe any one. | 07 |
| | (b) | List various types of printers and explain any one of them.. | 07 |
| OR | | | |
| Q-3 | (b) | Write a short notes on basic components of a digital computers | 07 |
| | (a) | Explain RAM? Types of RAM? Which did you select? Why? | 05 |
| | (b) | Explain characteristics of memory system and explain memory hierarchy. | 05 |
| | (c) | Explain cache operation, principle of locality and cache hierarchy. | 04 |
| OR | | | |
| Q-3 | (a) | Write short notes on instruction cycle and execution cycle organization of control register. | 05 |
| | (b) | Explain ROM? Types of ROM? Explain their application. | 05 |
| | (c) | Explain with examples types of complements method's using binary numbers systems | 04 |
| Q.4 | (a) | What is a Multiplexer? Explain 4-to-1 line multiplexer. | 07 |
| | (b) | What is Flip-Flop? Explain how a JK Flip Flop is made from an RS Flip Flop. | 07 |
| OR | | | |
| Q-4 | (a) | Explain RS Flip Flop by giving its characteristic table and the circuit diagram. | 04 |
| | (b) | Explain the working of Half-Adder and Full-Adder along with the circuit diagrams. | 06 |
| | (c) | What is the purpose of Binary Counter? Explain ripple counter. | 04 |
| Q.5 | (a) | Draw the block diagram of 8086 Intel microprocessor and explain queue and segment registers. | 07 |
| | (b) | Explain instruction format of 8086 microprocessor. | 07 |
| OR | | | |
| Q-5 | (a) | a) What do you mean by Addressing Techniques? Explain the direct, relative and indexed addressing techniques with an example. | 07 |
| | (b) | b) Define following terms: instruction word, instruction cycle, instruction counter, op-code register | 07 |
