

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA INTEGRATED – SEMESTER I- EXAMINATION –WINTER-2024

Subject Code: 2618601

Date: 31/12/2024

Subject Name: Fundamental of Computer Organization

Time:10:30 AM TO 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.
4. Use of simple calculators and non-programmable scientific calculators are permitted.

Q.1 (a) Answer the following. 07

1. What is RAM?
2. What is Register?
3. What is Control Bus?
4. What is Multiplexer?
5. Convert $(10101)_2$ into an Octal Number.
6. What is Flip-Flop.
7. What is Binary Counter.

(b) What is Peripheral Device? Explain any four Peripheral Device. 07

Q.2 (a) What is Universal GATE? Explain all Universal gate in detail. 07

(b) What is De Morgan's Theorem? Explain Perfect Induction Method. 07

OR

(b) What is Boolean algebra? Explain Derivation of a Boolean Algebra and its fundamental principles. 07

Q.3 (a) What is Shift Register? explain the operation and functionality of an RS Flip-Flop also Draw a Circuit of RS Flip-Flop. 07

(b) Explain the fundamental operation and applications of a multiplexer (MUX). 07

OR

Q.3 (a) Explain the concept of shift operations, including logical shifts and modulo operations. 07

(b) Explain 1 bit Binary Full Adder with diagram. 07

Q.4 (a) What is Instruction Word Formats-Number of Addresses? Explain all Addressing mode in Detail. 07

(b) Explain Instruction Cycle and Execution Cycle organization of Control Registers with Diagram. 07

OR

Q.4 (a) Explain the characteristics of a memory system and elaborate on the concept of memory hierarchy, including its components and their respective roles in computer architecture. 07

(b) Explain the different types of Read-Only Memory (ROM), detailing their distinct characteristics, applications within computer systems. 07

Q.5 (a) Describe the architecture of the 8086 microprocessors. 07

(b) Define Addressing technique and its principle. 07

OR

- Q.5** (a) List different types of buses. Explain the use of three-state drivers in bus interfaces. Illustrate asynchronous transfer on buses and explain the significance of each signal. **07**
- (b) Write a concise explanation of the Bus Interface Unit (BIU), detailing its role and importance within a CPU architecture. **07**
