



(University of Choice)

**MASINDE MULIRO UNIVERSITY OF
SCIENCE AND TECHNOLOGY
(MMUST)**

MAIN CAMPUS

**UNIVERSITY EXAMINATIONS
2021/2022 ACADEMIC YEAR**

**FOURTH YEAR FIRST SEMESTER SPECIAL/
SUPPLEMENTARY EXAMINATIONS**

**FOR THE DEGREE
OF
BACHELOR OF SCIENCE IN ELECTRICAL AND
COMMUNICATIONS ENGINEERING**

COURSE CODE: ECE 414

COURSE TITLE: MICROPROCESSORS

DATE: Tuesday, 04th October, 2022 **TIME:** 09.00a.m – 11.00a.m

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS.
QUESTION ONE CARRIES 30 MARKS AND ALL OTHERS 20 MARKS EACH.

TIME: 2 Hours

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 3 Printed Pages. Please Turn Over. ►

Question One

- a. Distinguish between the following terms; *kilobyte, megabyte, gigabyte, terabyte, long word* and *petabyte* [3 marks]
- b. With the aid of a block diagram, explain the functioning and sequence of operations of an arithmetic logic unit [5 marks]
- c. Give any five tasks performed by the Bus Interface Unit as well as the Execution Unit of 8086 microprocessor. [5 marks]
- d. Using relevant diagrams explain clearly the general purposes of data registers. [6 marks]
- e. Determine the status of different flags after addition of the following numbers.
 - (i) 07_H and CF_H [3marks]
 - (ii) CE_H and 9B_H [3marks]
- f. With the aid of a diagram, explain briefly the memory read operation in an 8085 microprocessor [5marks]

Question Two

- a. Explain the meaning of the phrase *addressing mode* [1mark]
 - i. Explain any three addressing modes of the 8086 microprocessor [6marks]
 - ii. Using assembly language, give examples each of *immediate addressing* and *register addressing* in 8085 microprocessor. [4 marks]
- b. Explain the following two instructions; **MOV CX, CS** and **MOV AX, [12H]** [2 marks]
- c. Give the two important reasons why although the 8086 is a 16-bit processor it deals with 8-bit memory. [2 marks]
- d. Enumerate any five advantages of memory segmentation. [6 marks]

Question Three

- a. Explain the concept of *instruction queue* in the 8086. [2 marks]

- b. By giving three examples in each case, explain the following instruction set groups for the 8086 microprocessor
- i. Data transfer group [4marks]
 - ii. Arithmetic group [4marks]
 - iii. Logical group [4marks]
- c. Explain briefly the following types of 8085 instructions
- i. 1-byte instructions [2marks]
 - ii. 2-byte instructions [2marks]
 - iii. 3-byte instructions [2marks]

Question Four

- a. Differentiate between;
- i. a compiler and an interpreter [2 marks]
 - ii. a compiler/interpreter and an assembler. [3 marks]
- b. State the addressing modes for each of the following 8086 microprocessor instructions:
- i. JMP [BX+DI]
 - ii. MOV AX, CX
 - iii. MOV AX, [SI]
 - iv. ADD AX, 1224H [4 marks]
- a. List any four tasks that a microcomputer is capable of doing. [4 marks]
- b. With the aid of a well labeled diagram, mention the total number of registers of 8086 and show how they are grouped. [7 marks]

