MACHAKOS UNIVERSITY

University Examinations for 2020/2021

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING

SECOND YEAR FIRST SEMESTER EXAMINATION FOR

CERTIFICATE IN ELECTRICAL MODULE 2

MICROELECTRONICS

DATE: 1/9/2021 **TIME: 2.30-5.30 PM**

INSTRUCTIONS TO CANDIDATES:

ATTEMPT ALL QUESTIONS

1. (a) Draw a labeled block diagram of a microcomputer and explain the function of each component. (12 marks)

   (b) Distinguish between each of the following

   (i) Microprocessor and microcomputer.

   (ii) Volatile and non-volatile memory

   (iii) Primary and secondary memory

   (iv) Dynamic and static RAM (8 marks)

2. (a) Describe the various computer generations making reference to the CPU technology. (8 marks)

   (b) Explain the function of the following registers with reference to the Intel 8085 microprocessor;

   (i) Accumulator

   (ii) Program Counter

   (iii) Instruction Register (6 marks)

   (c) Carry out the following operations

   (i) 23h+79h.

   (ii) $110001_2+100011_2$

   (iii) Convert 10001010_2 into hexadecimal system (6 marks)

3. (a) Explain three parameters that determine or indicate the performance power of a microcomputer (6 marks)

(b) State three microprocessor manufacturers and for each case state a microprocessor made by the respective company. (6 marks)

(c) Explain four functions of input/output ports in a microprocessor-based system. (8 marks)

4. (a) Draw a labeled schematic diagram showing the architecture of Intel 8085 microprocessor. (6 marks)

(b) Explain three main components of a central processing unit. (9 marks)

(c) Discuss the computer highway (5 marks)

5. (a) Explain the function of each of the following tools used in the development of a microcomputer system.

(i) Assembler

(ii) Compiler

(iii) Debugger

(iv) Text editor

(v) Loader (10 marks)

(b) A certain microcomputer memory has 16 address bits and 8 data bits. Determine the:

(i) Word size;

(ii) Number of memory locations;

(iii) Memory capacity in bits;

(iv) Memory capacity in kilobytes. (10 marks)