MACHAKOS UNIVERSITY

University Examinations for 2020/2021 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

SECOND YEAR SECOND TERM EXAMINATION FOR

CERTIFICATE IN ELECTRICAL AND ELECTRONICS ENGINEERING

MICROELECTRONICS

DATE: 18/6/2021   **TIME: 11.30-2.30 PM**

INSTRUCTIONS

ATTEMPT ALL QUESTIONS

1. a) 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)

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

      i.   Memory Address Register

      ii.   Flags register

      iii. Instruction Register   (6 marks)

   c) Determine the condition of the flags register after the arithmetic operation 23h+79h.

                                         (6 marks)

2. a) A certain microprocessor has 16 address bits and 8 data bits. Determine;

      i.   Word size

      ii.   Number of memory locations

      iii. Memory capacity in kilobytes   (8 marks)

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

3. a) For each of the following assembly instructions explain the meaning and for each case state the addressing modes used.;

    i.   MVI B,21H

    ii.   STA 3000H

    iii.   MOV A,C

    iv.   LXI H ,1945H

    v.   LDA 4000H   (15 marks)

b) Define each of the following :

    i.   Machine language

    ii.   Assembler

    iii.   Delimiter

    iv.   Op code

    v.   Operand   (5 marks)

4. a) Write an assembly language program to do the following:

-load register C with immediate value 34h

-move data 65h to register A

-move data 1899h to register pair HL

-transfer content of register A to memory address 2000h

-move data in memory location 7000h to the accumulator

-store the content of register C to registers B and E

-copy the content of register B to memory location 4000h

-processor halt.   (10 marks)

b) Describe Five tools used in the development of a microcomputer system. (10 marks)

5. 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)