



MACHAKOS UNIVERSITY

University Examination 2018/2019

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

THIRD YEAR SECOND SEMESTER EXAMINATION FOR

DIPLOMA IN ELECTRICAL AND ELECTRONIC ENGINEERING

EED 312: MICROPROCESSOR SYSTEMS

DATE: 29/4/2019

TIME: 2.00-4.00 PM

INSTRUCTIONS:

Answer Question 1 and Any Other Two Questions

QUESTION ONE (30 MARKS)

- a) With the aid of a labeled diagram, explain the function of the main components of a microprocessor. (9 marks)
- b) Describe the function of the following registers with reference to the Intel 8085 microprocessor;
- i. Program Counter
 - ii. Instruction Register
 - iii. Stack pointer (6 marks)
- c) A typical computer has a memory with 4096 words. Each word is 8 bits wide. Determine;
- i. Number of address lines
 - ii. Capacity in kilobytes
 - iii. Number of hexadecimal digits needed to state an address value. (6 marks)
- d) Explain the meaning of the following assembly instructions and for each case state the addressing modes used.;
- I. MVI B,32H
 - II. SHLD 1900_H

III. XCHG

(9 marks)

QUESTION TWO (20 MARKS)

- a) Describe the various computer generations highlighting the processor technology and salient features. (10 marks)
- b) i Explain two software testing methods.
- ii Explain the function of any three hardware tools in microcomputer development (10 marks)

QUESTION THREE (20 MARKS)

- a) Draw a flowchart illustrating the process of developing a microcomputer system. (7 marks)
- b) Write an assembly language program originating at address 9000H to do the following:
- load register A with immediate value 77H
 - move data 42H to register D
 - move data 1945H to register pair BC
 - transfer content of register A to memory address 2000h
 - move data in memory address 7000h to register C
 - move content of H and L to memory starting at address 8000h
 - exchange content of register pair DE to that of HL
 - transfer content of memory address 2000h and 2001h to register pair HL
 - move content of accumulator to register C
 - processor halt.
- (13 marks)

QUESTION FOUR (20 MARKS)

- a) State the function of each of the following software development tools:
- i. linker
 - ii. Interpreter
 - iii. debugger
 - iv. cross assembler
 - v. Compiler
- (5 marks)

- b) Describe three microprocessor addressing modes and for each case state an instruction example. (9 marks)
- c) Determine the condition of the flags after each of the following arithmetic
- i. 35H+9CH
 - ii. B4-17H. (6 marks)

QUESTION FIVE (20 MARKS)

- a) i Outline the sequence of events when an interrupt occurs in a microcomputer.
- ii Distinguish between maskable and non-maskable interrupts (8 marks)
- b) With an aid of a labeled diagram explain the Daisy Chain method for prioritizing interrupting devices in a computer system. (12 marks)