



MACHAKOS UNIVERSITY

University Examinations for 2016/2017

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

THIRD YEAR SECOND SEMESTER EXAMINATION FOR DIPLOMA IN
ELECTRICAL AND ELECTRONICS ENGINEERING

EED 312: MICROPROCESSORS

DATE: 31/5/2017

TIME: 2:00 - 4:00 PM

INSTRUCTIONS

Answer Question One and Any Other Two Questions

1.
 - (a) With an aid of a labeled diagram, describe the main components of a digital computer. (10 marks)
 - (b) Describe the four major central processing unit evolution stages stating the technology used in each case. (8 marks)
 - (c) Describe the function of the following microprocessor registers;
 - I. program counter
 - II. Instruction register
 - III. Stack pointer (6 marks)
 - (d) Draw flowchart diagram illustrating procedure for microcomputer development. (6 marks)
2.
 - (a)
 - (i) Distinguish between microprocessor and multiprocessor computer.
 - (ii) A typical computer has 16 lines for data and 24 lines for address.

Determine for system;

- I. Word size
- II. Maximum addressable locations
- III. Capacity in mega bytes
- IV. Number of hexadecimal digits needed to state an address value.
(8 marks)

- (b) Describe four microprocessor addressing modes and for each case cite an instruction example.
(12 marks)

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

- I. STA 3000_H
- II. LDA 1949_H
- III. MOV A_IB
(9 marks)

- (b) Draw a typical 8 bit microprocessor architecture schematic diagram and explain the function of each element.
(11 marks)

4. (a) Write an assembly program for the following algorithm:

- load register B with immediate value 67
- move data 55h to accumulator
- move data 19AF h to register pair HL
- transfer content of register A to memory address 2000h
- move data in memory address 6000h to register C
- move content of H and L to memory starting at address 8000h
- exchange content of register pair BC to that of HL
- transfer content of memory address 2000h and 2001h to register pair HL
- add content of accumulator to register C
- processor halt.
(10 marks)

- (b) Hand code the program resulting in 4 (a) assuming that it originates at address 0000h (5 marks)
- (c) Define the following terms as applied to programming:
- (i) Machine code
 - (ii) Assembly language
 - (iii) Assembler
 - (iv) Interpreter
 - (v) Compiler (5 marks)
5. (a) (i) Define the term interrupt
- (ii) Distinguish between maskable and non-maskable interrupts.
- (iii) Draw a diagram illustrating how a microprocessor is connected to two devices via a programmable interrupt controller (PIC) (12 marks)
- (b) Explain the function of the following pins on the Intel 8085 chip;
- i. HLDA
 - ii. HOLD
 - iii. RESET OUT
 - iv. X1 and X2 (8 marks)