



MACHAKOS UNIVERSITY

University Examinations 2017/2018

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING

**THIRD YEAR SECOND SEMESTER EXAMINATION DIPLOMA IN ELECTRICAL
ENGINEERING**

EED 312: MICROPROCESSOR SYSTEMS

DATE: 19/12/2017

TIME: 2.00-4.00 PM

INSTRUCTIONS:

Attempt Question One And Any Other Two Questions

1.
 - (a) Draw a labeled block diagram of a microcomputer and its describe the main components. (9 marks)
 - (b) Describe the function of the following registers with reference to the Intel 8085 microprocessor;
 - i) program counter
 - ii) Flags register
 - iii) Stack pointer (6 marks)
 - (c) A certain memory stores 1024 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) STA 3000_H
 - ii) LHLD 1949_H
 - iii) XCHG
- (9 marks)

2. (a) Enumerate the technological milestones of the electronic computer CPU from 1946 to date. (10 marks)

(b) Explain the function of the following pins on the Intel 8085 chip;

i) ALE

ii) HOLD

iii) RESET IN

iv) CLOCK OUT

v) X1 and X2 (10 marks)

3 (a) Outline the stages of developing a software for computer application.

(7 marks)

(b) Write an assembly language program to do the following:

-load register A with immediate value 53h

-move data 21h to register B

-move data 1900h to register pair DE

-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)

4. (a) Define the following software development tools:
- (i) editor
 - (ii) Compiler
 - (iii) debugger
 - (iv) Assembler
 - (v) Interpreter (5 marks)
- (b) Describe three microprocessor addressing modes and for each case state an instruction example. (9 marks)
- (c) Draw a labeled architecture diagram of a typical 8 bit microprocessor. (6 marks)
5. (a) (i) Distinguish between maskable and non-maskable interrupts
- (ii) Outline the sequence of events when an interrupt occurs in a microcomputer. (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)