MACHAKOS UNIVERSITY COLLEGE

(A Constituent College of Kenyatta University)
University Examinations for 2015/2016 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

FIRST SEMESTER EXAMINATION FOR DIPLOMA IN TELECOMMUNICATION ENGINEERING

EPC 207: MICROELECTRONICS

DATE: **TIME:**

INSTRUCTIONS

Attempt Question One and Any Other Two Questions

SECTION A: (COMPULSORY)

1. (a) State any three parameters that determines the performance of a microcomputer. (3 marks)

(b) With an aid of a labeled block diagram explain the functions of various components of a microcomputer. (12 marks)

(c) A 3 ½ inch double-sided floppy disc has 80 tracks per side, 12 sectors per track and 512 bytes per sector. Determine for this drive;

I. total number of sectors

II. total capacity (6 marks)

(d) Write a program in assembly to do the following;

-load register A with data 39H

-move value 16H to register B

-load data 1098H to register pair DE

-transfer content of register E to registers H and L

-move data in the accumulator to memory address 5000H

-transfer content in memory address 4000H to register C (9 marks)

SECTION B: ANSWER ANY OTHER TWO QUESTIONS

2. (a) Explain the function of each of the following registers with reference to the Intel 8085 processor;

I. Accumulator ;

II. Instruction register;

III. Program Counter. (6 marks)

(b) A certain computer has 8 data lines and 24 address lines. Determine for this computer;

I. word size

II. maximum addressable memory locations

III. capacity in bytes (6 marks)

(c) Describe four computer generations highlighting the processor technology for each generation. (8 marks)

3. (a) (i) State two applications of ROM semiconductor memory. (2 marks)

(ii) Distinguish between EPROM and EEPROM with reference to primary memory. (4 marks)

(b) With an aid of a labeled circuit diagram, describe the working principle of a Dynamic RAM cell. (9 marks)

(c) Draw a labeled circuit diagram of a diode-based 4x4 PROM memory.

(5 marks)

4. (a) For each of the following assembly instructions;

I. State the addressing mode used

II. Explain the meaning of the instruction

- MVI A,29H
- MOV B, A
- LXI H, 2000H
- STA 6800H
- LDA 2000H
- SHLD 4019H (12 marks)

(b) Define the following terms used in computers;

I. Assembler

II. Machine language

III. Compiler

IV. Interpreter (8 marks)

5. (a) (i) Draw a labeled schematic diagram of a typical 8-bit microprocessor.

(ii) Explain the three main components of a control processing unit.

(11 marks)

(b) Carry out the following arithmetic;

i. $111001001_2+10000111_2$

ii. $42CF_H + 900A_H$

iii. $2000_H - C8_H$ (9 marks)