TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF MEDICAL ENGINEERING

UNIVERSITY EXAMINATION FOR:

DIPLOMA IN MEDICAL ENGINEERING

EEP 2351: MICROPROCESSOR SYSTEMS

SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES: SEPTEMBER 2018

TIME: 2HOURS

DATE: Pick DateSep 2018

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **FIVE** questions. Attempt any THREE questions.

Do not write on the question paper.

QUESTION ONE

a) Given the program in table 1, state the contents of the following during program execution;

i) A, B and C registers

ii) Memory locations, 2000H to 2004 H

(11 marks)

OPCODE	ORG	2000H
3E67	MVI	A,67H
4F	MOV	C,A
067B	MVI	B,7BH
80	ADD	B

Table 1

b) Write an assembly language program to sum two 8-bit numbers stored in consecutive memory locations 2000H and 2001H and place the result in location 4020H.

(9 marks)

QUESTION TWO

a) Write machine language program and its equivalent assembly language, showing memory location of the following;

   i) Load the register C with immediate data 78H

   ii) Transfer this value into two registers A and B using direct addressing

   iii) Transfer this value into register E

   iv) Load the register pair HL with immediate data 8FE2H

   Assume the program starts at memory location 3602H

(12 marks)

b) Describe the function of each of the following microprocessor registers.

   i) Program counter

   ii) Instruction register

   iii) Memory address register

(6 marks)

c) Describe memory Map as applied to microprocessor memories.

(2 marks)

QUESTION THREE

a) Define each of the following microprocessor addressing modes giving one example in each case.

   i) Register indirect

   ii) Immediate

   iii) Register

   iv) Implied

(8 marks)

b) Outline the operation of a microprocessor basic machine cycle

(6 marks)

c) Explain the use of each of the following microprocessor memories

   i) Cache

   ii) Virtual

   iii) Secondary

(6 marks)

QUESTION FOUR

a) Draw a labeled block diagram to illustrate the architecture of a typical 8-bit microcomputer.

(12 marks)

b) Describe the TWO addressing methods used to transfer data between a microcomputer bus and input/output devices, giving a typical microprocessor instruction for each.

(6 marks)

c) Describe main memory as applied to microprocessor.

(2 marks)

QUESTION FIVE

a) A microcomputer system has the following memory Map

ADDRESS RANGE (HEX)	DEVICE
0000 – 0FFF	ROM
2000 – 21FF	RAM
4000 – 400F	I/O

Table 2

Determine for this system the amount of

i) ROM

ii) RAM

iii) I/O

(9 marks)

b) Write an assembly language program segment to perform the following;

i) Sum two consecutive 8-bit data items stored in memory, from address 0000H

ii) Store the result in memory location 1000H.

(11 marks)