TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF ENGINEERING AND TECHOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING

DIPLOMA IN ELECTRICAL POWER ENGINEERING

EEE2206 MICROPROCESSOR TECHNOLOGY I

END OF SEMESTER EXAMINATIONS

SERIES: May, 2016

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES:

1. You should have the following for this examination:
    - Answer booklet
    - Electronic calculator
    - 8085 Instruction set
2. This paper consists of FIVE questions.
3. Answer ANY THREE Questions
4. All questions carry equal marks

QUESTION ONE

(a) Explain the functions of the following:

      i.   Instruction register

      ii.   Accumulator

      iii.   Interrupt controller register

      iv.   General purpose registers   (8 marks)

(b) (i)   Draw the block diagram of the microprocessor architecture.

    (ii)   Explain the following addressing modes and give ONE instruction example in each case:

        I.   Register Indirect

        II.   Implicit

        III. Direct   (12marks)

QUESTION TWO

(a) Explain the following instructions sizes and give ONE instruction example in each case.

    i.   Three byte instruction

    ii.   One byte instruction

    iii. Two byte instruction   (7 marks)

(b) Explain the following instructions

      i.   LXI   B, 2050H

      ii.   SPHL

      iii. PUSH   H

      iv. POP   H   (8 marks)

(c) Write instructions to subtract 25H from 39H and store the difference in register C

                                                        (5 marks)

QUESTION THREE

(a) (i)   Distinguish between the '**stac**k' and '**stack pointer'**

   (ii)   Explain the term '**nesting**'.   (6 marks)

(b) Table Q5a shows ten data bytes stored in memory starting from address 3500H. All the data bytes are to be added together. Register B is to be used to store any carries generated while adding. The entire sum is stored in two consecutive memory locations 6000H and 6001H.

    i.   Draw the flowchart

    ii.   Write the program   (14 marks)

    Table Q5a

    Data (H):   20, 2D, 4F, 5E, 35, 78, 22, 9B, 06, 3A

QUESTION FOUR

(a) Explain the THREE instruction sizes and give ONE example for each case   (7 marks)

(b) A microprocessor addresses 64kB of memory consisting of 24kB of ROM followed by 32kB of RAM. The rest of the memory is current not used. The ROM starts from address 2000H.

    i.   Determine the size of the address bus

    ii.   Draw the memory map.   (7 marks)

(c) (i)   Distinguish between memory mapped and programmed input output methods.

    (ii)   State any TWO communication interface devices   (6 marks)

QUESTION FIVE

(a) A block of sixteen data bytes, shown in Table Q3, is stored in memory beginning from address 2050H. A program is required to move the entire block of data to new memory locations beginning from address 3000H.

    i.   Draw the flowchart

    ii.   Write the program   (14 marks

Table Q5a

Data (H):   42, 1F, 75, D3, E5, 64, 20, 2D, 4F, 5E, 35, 78, 22, 9B, 06, 3A

(a) For the program listing of table Q5b draw the trace table.   (6 marks)

Table Q5b

LXI	H, 3040h
LXI	SP, 5000h
MVI	B, 48h
MOV	A, B
MVI	C, 28h
ADD	C
INR	B
MOV	D, C