



TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering and Technology

DEPARTMENT OF ELECTRICAL & ELECTRONIC ENGINEERING

UNIVERSITY EXAMINATIONS FOR DIPLOMA IN TECHNOLOGY (ELECTRICAL &
ELECTRONIC ENGINEERING)

EEE 2206

MICROPROCESSOR TECHNOLOGY

SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES: SEPTEMBER 2018

TIME: 2 HOURS

DATE: Sep 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) Explain the functions of the following addressing modes
- (i) Immediate addressing
 - (ii) Register addressing
 - (iii) Direct addressing
 - (iv) Implicit addressing (8 marks)
- (b) Explain the operation in each of the following instructions:
- (i) PUSH B
 - (ii) POP B (6 marks)
- (C) (i) Distinguish between memory mapped and programmed input output methods
- (ii) State any FIVE communication interface devices (6 marks)

QUESTION TWO

- (a) Explain the functions of the following microprocessor registers
- (i) Stack pointer
 - (ii) Interrupt control
 - (iii) Memory addressing register
 - (iv) Instruction register (8 marks)
- (b) Write single instructions for each of the following 8085 microprocessor operations
- (i) Copy the contents of register B to the accumulator.
 - (ii) Transfer the data byte 45H to register C.
 - (iii) Copy the contents of the accumulator to memory location 3050H.
 - (iv) Exchange the contents of H and L registers with the contents of D and E (4 marks)
- (c) Explain the following terms:
- (i) T – state
 - (ii) Machine cycle
 - (iii) Subroutine
 - (iv) Instruction cycle (8 marks)

QUESTION THREE

- (a) For the program listing of table Q3a, draw the trace table. (8 marks)

Table Q3a	LXI	D, 3040H
	LXI	H, 4080H
	LXI	SP, 8000H
	MVI	A, 48h
	MVI	B, 28H
	ADD	C
	MOV	A, B
	DCR	B
	SPHL	

- (b) Explain the three instruction sizes and give ONE example for each case (7 marks)
- (c) A microprocessor with a clock speed of 10 MHz runs the program of table Q3c. Determine the total execution time.

Table Q3c	Label	Instruction	T – state	
		LXIH, 3000H	5	
		MVI M, 05H	4	
		MOV A, M	3	
	NXT	DCR A	4	
		JNZ NXT	7/10	
		MOV B, A	3	
		HLT	3	(5 marks)

QUESTION FOUR

- (a) Explain the operations of the following instructions:
- CALL 8050H
 - RET
 - DAD (6 marks)
- (b) Table Q4b 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.
- Draw the flowchart.
Write the program. (14 marks)
 - Table Q4b
Data (H) 20, 2D, 4F, 5E, 35, 78, 22, 9B, 06, 3A

QUESTION FIVE

- (a) A microprocessor addresses 64kB of memory consisting of 20kB of ROM beginning from address 2000H followed by 48kB of RAM.
- Determines the size of the address bus
 - Draw the memory map (8 marks)
- (b) The twenty data bytes shown in Table Q5b are 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.
- Draw the flowchart
 - Write the program (12 marks)

Table Q4a Data (H): 59, 78, 22, 9B, 06, 3A, 20, 2D, 4F, 5E, 35, 42, 1F, 75, D3, E5, 23, 34, D9, 47