

**TECHNICAL UNIVERSITY OF KENYA**

**FACULTY OF APPLIED SCIENCES AND TECHNOLOGY**

**SCHOOL OF COMPUTING & INFORMATION TECHNOLOGY**

**END OF SEMESTER EXAMINATION SERIES**

**FIRST SEMESTER EXAMINATIONS 2018/2019**

**FOURTH YEAR EXAMINATIONS FOR THE DEGREE OF**

**BACHELOR OF TECHNOLOGY IN COMPUTER NETWORK TECHNOLOGY**

**ECSI 3108: ASSEMBLY LANGUAGE PROGRAMMING**

**TIME: 2 Hours**

**Instructions to candidates:**

This paper consists of FIVE Questions.

Answer Question ONE [30 Marks] and any other TWO Questions [20 Marks Each].

Write your college number on the answer sheet.

This paper consists of 7 printed pages

**Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.**

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**QUESTION ONE (30 MARKS) COMPULSORY**

1. Distinguish between assembly and machine language programming (4MKS)
2. Write an assembly language program to add two 8-bit hexadecimal numbers stored at memory locations 09C4 and 09C5 and store the result in at 09C6 (4MKS)
3. Draw a program flowchart to represent the program operations for question one (a) above

(2MKS)

1. Explain the following terminologies as used in Assembly programming with an example in each case (4MKS)
   1. General Purpose Registers
   2. Program counter
2. Describe four classifications of 8085 processor instructions (8MKS)
3. Write a program in assembly language to exchange the 16-bit data (4MKS)
4. Given that the value 05h is stored in register B and the value 6h is stored in register C, write an assembly language that will calculate the totals of the two values and store the results in the accumulator (4MKS)

**QUESTION TWO (20 MARKS)**

1. Explain the role of five flags used in assembly programming language (10MKS)
2. Outline the five steps in writing an assembly language program (5MKS)
3. Explain the following microprocessor instructions as used in assembly language programming (5MKS)
   1. CMP B
   2. STAX B
   3. INR A
   4. INR M
   5. SPHL

**QUESTION THREE (20 MARKS)**

1. Describe four types of addressing modes used in assembly programming with an example illustration of each mode (8MKS)
2. Distinguish between “an instruction” and “an instruction set” as used in assembly programming languages (4MKS)
3. Draw a well labeled architecture of a 8085 microprocessor (8MKS)

**QUESTION FOUR (20 MARKS)**

1. Write an assembly programming language to perform the multiplication of two 8 bit numbers using 8085 (10MKS)
2. The 8085 instruction set is classified into three groups according to word size. Explain with examples the three classes (6MKS)
3. Write an assembly program to multiply a number by 8 (4MKS)

**QUESTION FIVE (20 MARKS)**

1. In assembly programming, a segmented memory divides the memory into groups of segmented sections. Explain any three sections of a memory segments (6MKS)
2. Write an assembly language program to subtract the contents of memory location 4001H from the memory location 200H and place the result in memory location 4002H (6MKS)
3. Write a program to fine the 2’s complement of the number stores at memory location 2500H and store at memory location 2503H and store the complemented number at memory location 2505H (4MKS)
4. Outline four comparisons (Dissimilarity ) between the 8085 and 8086 microprocessors using the tables provided (4MKS)

|  |  |  |
| --- | --- | --- |
| Comparison by | 8085 | 8086 |
| Size |  |  |
| Cost |  |  |
| Instruction queue |  |  |
| Pipelining |  |  |