



SOUTH EASTERN KENYA UNIVERSITY
UNIVERSITY EXAMINATIONS 2020/2021

**SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF
SCIENCE IN COMPUTER SCIENCE**

CSC 206: ASSEMBLY LANGUAGE PROGRAMMING

DATE: 8TH JULY, 2021

TIME: 1.30-3.30 PM

INSTRUCTIONS TO CANDIDATES

- a) Answer **ALL** questions from section A(Compulsory)
- b) Answer **ANY TWO** questions from section B

SECTION A: Compulsory (30 marks)

Question One

- a) Define the following terms as used in Assembly Language Programming: **(3 marks)**
 - i. Assembler
 - ii. Assembler directive
 - iii. Op-code
- b) Distinguish between local and global variables **(2 marks)**
- c) Highlight **THREE** merits of assembly language programming over high level programming languages **(3 marks)**
- d) Explain the basic structure of a High Level Assembly program. **(3 marks)**
- e) In assembly language for the 8085 family of CPU's, what are the meaning of the symbols \$, % and #.
(3 marks)

- f) State FOUR machine control instructions used in 8085 microprocessor (4 marks)
- g) State the function of given 8085 instruction giving the size of operands each case: (4 marks)
- i. JPE
 - ii. RPE
 - iii. XCHG
 - iv. JNZ.
- h) Represent:
- i. HELP in EBCDIC coding system. (1 mark)
 - ii. 1001000 1000101 1001100 1010000 in ASCII (1 mark)
 - iii. 7093₁₀ in BCD (1 mark)
- i) Write High Level Assembly language instructions for the 8085 family of CPU's for removing data from the stack without popping it. (5 marks)

SECTION B: CHOOSE ANY TWO QUESTIONS

Question Two

- a) Give the binary representation of -15 in each of the following data representations
- i) 8 bit one's complement (2 marks)
 - ii) 8 bit signed magnitude (2 marks)
- b) Define the actions of each of the following instructions in High Level Assembly programming language. (4 marks)
- i) INC COUNT ;
 - ii) MOV TOTAL, 48 ;
 - iii) ADD AH, BH ;
 - iv) ADD MARKS, 10
- c) Describe how a CPU like the **8085** family of CPU's implements the basic **POP** and **PUSH** instructions. Your answer must include one or more diagrams (4 marks)
- d) Explain the functions of the following assembly registers. (8 marks)
- i) Instruction Pointer register (IP)
 - ii) Program counter (PC)
 - iii) Base Pointer register (BP)
 - iv) Accumulator register

Question Three

- a) Write an **8085** High Level Assembly Language program to illustrate bubble sort in assembly language. **(6 marks)**
- b) What are the three main types of computer programming languages? Give an example in each case **(6 marks)**
- c) With the aid an example in each case, explain the following **8085** microprocessor addressing modes: **(8 marks)**
- i) Direct addressing mode.
 - ii) Register addressing mode.
 - iii) Indexed addressing mode
 - iv) Immediate addressing mode

Question Four

- a) What is the difference between **mov (ebx, #125)**, **mov (ebx, 125)** and **mov (ebx, &j)**? **(6 marks)**
- b) Write an assembly language program to convert two BCD numbers in memory to the equivalent HEX number using the 8085 instruction set. **(6 marks)**
- c) With suitable examples, explain FOUR types of instructions available in assembly language programming **(8 marks)**