

KABARAK



UNIVERSITY

UNIVERSITY EXAMINATIONS
MAIN CAMPUS

FIRST SEMESTER 2019/2020 ACADEMIC YEAR

EXAMINATION FOR THE DEGREE OF BACHELOR SCIENCE IN
COMPUTER SCIENCE

COMP 225/INTE 223: ASSEMBLY LANGUAGE PROGRAMMING

STREAM: Y2S2

TIME: 11:00-1:00PM

EXAMINATION SESSION: SEP- DEC

DATE: 10/12/2019

VENUE: AUDITORIUM

COPIES: 265

INSTRUCTIONS TO CANDIDATES

- 1. Answer Question 1 and any other two questions in the answer booklet provided.**
- 2. Do not write on your question papers. All rough work should be done in your answer booklet.**
- 3. Clearly indicate which question you are answering.**
- 4. Write neatly and legibly.**
- 5. Edit your work for language and grammar errors.**

As members of Kabarak University family, we purpose at all times and in all places, to set apart in one's heart, Jesus as Lord. (1 Peter 3:15)



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6. Follow all the instructions in the answer booklet

QUESTION ONE (30 marks)

- (a) What is an assembler? Compare the access time of an assembler and a compiler. (3mks)
- (b) Explain any three importance of learning assembly language programs (3mks)
- (c) Write an instruction that computes two's complement of a number stored in an accumulator (2mks)
- (d) What is the difference between PUSHF and PUSHA instructions in 8086 (2mks)
- (e) Demonstrate how to use of XOR instruction to invert bits and OR instructions to set bits to ones (4mks)
- (f) What do square brackets means when they appear in an operand? (2mks)
- (g) Explain the function of the two special purpose registers in 8086 microprocessor (2mks)
- (h) Explain the four fields of any assembly language program (4mks)
- (i) Write any four rules of using a MOV instruction with examples in each (4mks)
- (j) Explain NEAR CALL and FAR CALL procedure. (2mks)
- (k) Explain the functions of all general purpose registers of 8086 (4mks)

QUESTION TWO (20 marks)

- (a) Compare the procedures and Macros (4mks)
- (b) Computer system is made up of three functional buses parts. Explain them (3mks)
- (c) Write a program in 8086 to add two 16-bit resulting to a sum larger than 16 bits. (4mks)
- (d) Explain with examples CALL and RET instructions (4mks)
- (e) Which register addresses the start of the program's machine code in memory (2mks)
- (f) Identify the addressing modes used in the following instructions:
 - (i) MOV DS, AX (ii) MOV AX, [4172 H] (iii) ADD AX, [SI] (3mks)

QUESTION THREE (20 marks)

- (a) What is the maximum memory size that can be addressed by 8086? (2mks)
- (b) To speed up the processor operations, the processor has a register. Explain the functions of all general purpose registers (4mks)
- (c) Write a program to create a procedure *sum* that takes two numbers as arguments, does their summation and returns the result. Call this procedure twice in your main program. (4mks)
- (d) Explain the difference between operation of SAR and SHR instructions with the use of an examples (4mks)
- (e) Write an instruction that will transfer the contents of extra segment register to data segment register (2mks)
- (f) List the four registers that can be used to address memory (4mks)

QUESTION FOUR (20 marks)

- (a) Explain the role of the Bus interface unit(BIU) and the Execution unit(EU) in 8086 (4mks)
- (b) Explain the three characteristics that classifies any microprocessor (3mks)
- (c) If the value of AX=22FFh, what is the new value of AX after performing SAR AX, 1 (4mks)
- (d) Write an 8086 assembly language program that clears all bits in BX register using any of the logical instructions. (4mks)
- (e) What is the functional difference between BP and SP register (2mks)
- (f) Write an assembly language program for 8086 to divides 16 bit unsigned number by a 8bit register (3mks)

QUESTION FIVE (20 marks)

- (a) What is the difference between the following instructions MOV AL, 12H and MOV AL, [12H] (2mks)
- (b) Show the syntax for the instructions ADD and ADC . What are the acceptable operands for the destination and source (3mks)
- (c) Explain the Based Indexed Relative Addressing mode with an example of an instruction (4mks)
- (d) Create a macro to be used in a program for the addition of any three values contained in any three general purpose registers. Use this macro to implement any two problems (5mks)
- (e) What is the difference between MOV and MOVS instruction (2mks)
- (f) What is the order of registers when POPA is used (4mks)