

Date of Examination: 07/11/2021

AHSANULLAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

Department/School: Computer Science and Engineering

Program: Computer Science and Engineering

Semester Final Examination: Fall 2020

Year: 3rd

Semester: 1st

Course Number: CSE3107

Course Name: Microprocessors

Time: 02(Two) Hours

Full Marks: 50

Use single answer script

Instructions:	i)	Answer script should be hand written and should be written in A4 white paper. You must submit the hard copy of this answer script to the Department when the university reopens.								
	ii)	<p>You must write the following information at the top page of each answer script:</p> <table><tr><td>Department:</td><td>Program:</td></tr><tr><td>Course no:</td><td>Course Title:</td></tr><tr><td>Examination:</td><td>Semester (Session):</td></tr><tr><td>Student ID:</td><td>Signature and Date:</td></tr></table>	Department:	Program:	Course no:	Course Title:	Examination:	Semester (Session):	Student ID:	Signature and Date:
Department:	Program:									
Course no:	Course Title:									
Examination:	Semester (Session):									
Student ID:	Signature and Date:									
	iii)	Write down Student ID, Course number and put your signature on top of every single page of the answer script.								
	iv)	Write down page number at the bottom of every page of the answer script.								
	v)	Upload the scan copy of your answer script in PDF format through provided google form at the respective course site (i.e., google classroom) using institutional email within the allocated time. Uploading clear and readable scan copy (uncorrupted) is your responsibility and must cover the full page of your answer script. However, for clear and readable scan copy of the answer script student should use only one side of a page for answering the questions.								
	vi)	You must avoid plagiarism , maintain academic integrity, and ethics . You are not allowed to take any help from another individual and if taken so can result in stern disciplinary actions from the university authority.								
	vii)	Marks allotted are indicated in the right margin .								
	viii)	Necessary charts/tables are attached at the end of the question paper. You may use graph papers where necessary.								
	ix)	Assume any reasonable data if needed.								
	x)	Symbols and characters have their usual meaning.								
	xi)	Before uploading rename the PDF file as CourseNo_StudentID.pdf For example, CE 451_180103001.pdf								
	xii)	The answer script (one single pdf file) must be uploaded at designated location in the provided google form link available in the google classroom.								

There are 06 (Six) Questions. Answer any 04 (Four).

Question 1. [Marks: 12.5]		
a)	Write an 8086 assembly language program to set the sign flag.	[6.0]
b)	If the memory chip size is 2048 x 8 bits, how many chips are required to make up 16K –byte memory. Assuming the microprocessor is completing an RST 6.5 interrupt request, check to see if RST 7.5 is pending. If it is pending, enable RST 7.5 without affecting any other interrupts; otherwise return to the main program.	[6.5]
Question 2. [Marks: 12.5]		
a)	Write an assembly program to input two numbers in BL and CL respectively. Add the contents of BL and CL, and then provide the result in decimal. Store result in CL. Show your name, Id last three digits and the contents of CL in the output screen.	[6.0]
b)	Write instructions to <ul style="list-style-type: none"> i) Clear the accumulator. ii) Load 05H in register B and load register C with the contents of memory location C200H. iii) Increment the contents of accumulator and then add register B and C with the contents of accumulator. iv) Display the answer in the output port 01H and also store the result in memory location D500H. 	[6.5]
Question 3. [Marks: 12.5]		
a)	Write down the similarities between PUSH-POP and CALL-RET. If an output port and input port can have the same 8-bit address, how does the 8085 differentiate between the ports.	[6.0]
b)	Write an 8086 assembly language program to compare a source string of 100 ₁₀ words pointed by an offset of 5000H in the data segment with a destination string pointed by an offset 7000H in another segment. The program should be halted as soon as a match is found or the end of string is reached.	[6.5]
Question 4. [Marks: 12.5]		
a)	Write down an instruction sequence to disable the instruction cache and freeze the data cache.	[6.0]
b)	What is the equation to calculate the volume of a sphere? Write a 68040 assembly language program to compute the volume of a sphere.	[6.5]
Question 5. [Marks: 12.5]		
a)	Write an 8086 assembly language program that will perform the following operation: $AX = 3 * CL - 2 * BL + (BH / 4)$ Assume that the stack pointer is already initialized and all numbers are unsigned.	[6.0]
b)	A bar code scanner scans the boxes being shipped from the loading dock and records all the codes in computer memory; the end of the data is indicated by the byte 00. The code 1011 0111 (B7H) is assigned to 21-inch television sets. Write a program to count the number of 21-inch television sets that were shipped from the following data set. Data(H) FA, 67, B7, B8, B7, B7, FA, 00	[6.5]

Question 6. [Marks: 12.5]		
a)	<p>What are the values of remainder and quotient and the contents of AX, BX and DX registers after the execution of the following instruction sequence?</p> <pre style="text-align: center;"> MOV DX, 0 MOV AX, -5 MOV BX, 2 IDIV BX </pre>	[6.0]
b)	<p>Assume the following data prior to execution of each one of the above instructions independently. Assume all numbers in hexadecimal.</p> <p>[DS] = 3000H, [SI] = 0400H, [ES] = 5000H, [DI] = 0500H, [DX] = 0400H, DF = 0, [SP] = 5000H, [BX] = 6000H, [SS] = 6000H, Value of START = 05H, [AX] = 00A9H, [36000H] = 02H, [36001H] = 03H, [50500H] = 05H, [30400H] = 02H, [30401H] = 03H</p> <p>Determine the effect of each one of the following 8086 instructions:</p> <ul style="list-style-type: none"> i) PUSH BX ii) DIV DH iii) MOV START [BX], AL 	[6.5]