(Knowledge for Development)

KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS
2020/2021 ACADEMIC YEAR

END OF SEMESTER EXAMINATIONS
YEAR TWO SEMESTER TWO EXAMINATIONS

FOR THE DEGREE OF BACHELOR OF SCIENCE COMPUTER SCIENCE

COURSE CODE : CSC 222

COURSE TITLE : **MICROPROCESSOR & ASSEMBLY PROGRAMMING**

DATE: 07/10/2021 **TIME:** 09:00 A.M – 11:00 A.M

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTIONS ONE AND ANY OTHER TWO.

QUESTION ONE (COMPULSORY) [30 MARKS]

a) Differentiate between Intel & Motorola Microprocessor **[4 Marks]**

b) Describe the 4^{TH} generation microprocessor. **[4 Marks]**

c) Describe characteristics of CISC architecture **[6 Marks]**

d) True/False Question. Explain your answer

I. Power PC find its application in military and aerospace.

II. RISC has relatively few instructions.

III. CISC has fixed length instruction formats.

IV. RISC processor executes 1 instruction in one clock cycle. **[4 Marks]**

e) Draw and discuss and write cycle timing diagrams of 8086 minimum mode. **[4 Marks]**

f) Explain the physical address formation of in 8086 **[4 Marks]**

g) How does 8086 differentiate between an opcode and instruction data? **[4 Marks]**

QUESTION TWO [20 MARKS]

a) Describe the architectural and signal differences between 8086 and 8088 **[6 Marks]**

b) Describe the following **[4 Marks]**

i. Cache Hits

ii. Cache Miss

iii. Cache Consistency

iv. Snarf

c) Differentiate I/O mapped I/O and Memory mapped I/O. **[4 Marks]**

d) Give the sum and the flag settings for AF, SF, ZF, CF, OF, and PF after hexadecimally adding 62A0 to each of the following: i. 1234 ii. 4321 iii. CFA0 **[6 Marks]**

QUESTION THREE [20 MARKS]

a) Distinguish between the jump and loop instruction. **[4 Marks]**

b) Determine if the following are TRUE/FALSE. Give reason for your answer **[4 Marks]**

i. Address decoder determine whether I/O is memory mapped or I/O mapped.
ii. Interface connecting, I/O with memory.
iii. Buses are only synchronous.
iv. 212 is 2 KB.

c) Describe how **D**irect **M**emory **A**ccess (DMA)works to transfer data from memory to a peripheral. **[6 Marks]**

d) Explain the working of 8254 Programmable Timer. **[6 Marks]**

QUESTION FOUR [20 MARKS]

a) Write a program to find out the number of positive numbers and negative numbers from a given series of signed numbers. **[6 Marks]**

b) Write a program to move the contents of the memory location 0700H to register BX and also to CX. Add immediate byte 10H to the data residing in memory location, whose address is computed using DS=3000H and offset=0200H. Store the result of the addition in 0500H. Assume that the data is located in the segment specified by the data segment register which contain 3000H. **[6 Marks]**

c) State True or False

i. Assembly language depends on the CPU architecture of the machine for which it was designed.
ii. An assembly language for solving a problem is very efficient compared to the same program written in a High-Level Language.
iii. Writing application programs in assembly language is difficult compared to writing in high level language.
iv. There are many assemblers available for the IBM PC. **[4 Marks]**

d) Differentiate between the respective shift and rotate instructions **[4 Marks]**

QUESTION FIVE [20 MARKS]

a) Draw a flow chart and write a program to add a data byte located at offset 0500H in 2000H segment to another data byte available at 0600H in the same segment and store the result at 0700H in the same segment. **[6 Marks]**

b) Explain in details the register of 8086. Draw appropriate diagram **[6 Marks]**

c) Describe the characteristics of RISC architecture **[4 Marks]**

d) Fill in the blanks

i. Assembly language use _____ to represent operation codes

ii. Assembly language use _____ to represent operands.

iii. One assembly language instruction become _____machine for which it was designed.

iv. A translator which translates an assembly language program to machine language is called_____. **[4 Marks]**