TECHNICAL UNIVERSITY OF MOMBASA

INSTITUTE OF COMPUTING AND INFORMATICS

Select department

UNIVERSITY EXAMINATION FOR:

BTIT/MAY2016/S-PT/BSIT/SEP2014/J-FT/BMCS/SEP2014/J-FT

EIT 4306/ICS 2305: SYSTEM PROGRAMMING

SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES: SEPTEMBER 2018

TIME: 2HOURS

DATE: Sep 2018

Instructions to Candidates
You should have the following for this examination
-Answer Booklet, examination pass and student ID
This paper consists of Choose No questions. AttemptChoose instruction.
Do not write on the question paper.

Question ONE

a. Explain the function of the following assembler directives:

   i.   Assume
   ii.   Org
   iii. Ends
   iv. DB   (4 Marks)

b. Define opcode and operand, and specify the opcode and the operand in the instruction

MOV H, L.   (3 Marks)

c. Differentiate between the following types of interrupts

   i.   Hardware and software interrupts
   ii.   Vectored and Non Vectored interrupt:
   iii. Maskable and Non Maskable interrupts.   (6 Marks)

c. Explain in brief the functions of the following 8086 pins:

   i.   ALE

ii.   INTR
iii.   Ready
iv.   Reset
v. $\overline{BHE}$ /S7   (5 Marks)

e. Write a program in assembly language that displays the message "welcome to assembly language programming" on the screen.   (6 Marks)

f.   Draw and explain the timing diagram of write cycle in 8086 in minimum mode.
                                                                                             (6 Marks)

QUESTION 2(20 Marks)

a. List any four flag registers in 8086   (4 Marks)

b.   Distinguish between:

i.   Compiler and assembler program
ii.   Macro and procedure
iii.   External and internal interrupts   (6 Marks)

c. Identify the function of the following string commands in assembly language

i.   SCAS
ii.   INS
iii.   LODS   (6 Marks)
d. Explain the two separate units of the 8086 CPU   (4 Marks)

QUESTION 3(20 Marks)

a. What are the advantages of an assembly language in comparison with high level

Languages?   (3 Marks)

b. Differentiate RISC and CISC processors.   (3 Marks)

c. What is the need for unconditional jump instructions, explain different conditional jump supported by 8086.
(8 Marks)

d. Discuss the modes of data transfer in Direct Memory access (DMA)   (6 Marks)

QUESTION 4(20 Marks)

a. Explain the following assembly language development tools

i.   Loaders
ii.   Linker
iii.   Assembler   (3 Marks)

b. Describe the assembly language development phases (6 Marks)

c. Using example explain the function of the following assembly directives

    i.   ORG
   ii.   PROC
  iii.   EQU (6 Marks)

d. State conditions that will make execution unit (EU) of 8086 enter wait mode (6 Marks)

QUESTION 5(20 Marks)

a. What is interrupt vector table? (2 Marks)

b. What is the difference between minimum and maximum modes of 8086? How are these modes selected? (4 Marks)

c. Differentiate between the following instructions:
    i.   RCL and RCR

   ii.   ADD and ADC

  iii.   ROL and ROR (6 Marks)

d. Describe the steps of how the 8086 processor handles an interrupt once an

Interrupt signal is asserted in INTR pin (8 Marks)