TECHNICAL UNIVERSITY OF MOMBASA

FOET

COMPUTING AND INFORMATICS

UNIVERSITY EXAMINATION FOR:

BACHELOR OF TECHNOLOGY IN INFORMATION AND COMMUNICATION TECHNOLOGY

EIT 4306: SYSTEMS PROGRAMMING

END OF SEMESTER EXAMINATION

SERIES: 2016/2017

TIME: 2 HOURS

DATE: Pick DateSelect MonthPick Year

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of 5 questions. Attempt **Question ONE (Mandatory) and any other TWO questions**

Do not write on the question paper.

INSTRUCTIONS: Answer Question ONE and any other TWO questions.

SECTION A

QUESTION 1(30 Marks)

a. List the advantages of assembly language programming over machine language. (3 Marks)

b. State the functions of the following code segment registers:

i. Stack segment
ii. Code segment
iii. Data segment
iv. Extra Segment (4 Marks)

c. What is an interrupt? Give any two sources of interrupts (3 Marks)

d. Explain the function of the following minimum mode pins

i. DT/$\overline{R}$
ii. HLDA
iii. M/$\overline{IO}$ (6 Marks)

e. Explain the fetch execute cycle of the 8086 (5 Marks)

f. Explain the following declaration statement in 8086 assembly language

i. var1 DB?

ii. DB 10

iii. X DW? (3 Marks)

g. Using a diagram, explain the timing diagram of read cycle in 8086 in minimum mode (6 Marks)

QUESTION 2(20 Marks)

a. Explain the four elements of assembly language statement (4 Marks)

b. Explain the role of Bus interface unit (BIU) and Execution Unit (EU) in 8086 (4 Marks)

c. Using an appropriate example explain the following assembly instructions:

i. ADD

ii. SUB

iii. CMP (6 Marks)

d. Describe the instruction format of the 8086. (6 Marks)

QUESTION 3(20 Marks)

a. state the uses of interrupts (2 Marks)

b. Distinguish between the following commands:

i. LOOP and LOOPZ

ii. LOOPNE and LOOPZ

iii. RETN and RETF (6 Marks)

c. Give five features provided by an assembler (5 Marks)

d. What is DMA? Explain how it works (7 Marks)

QUESTION 4(20 Marks)

a. Give any three miscellaneous instructions 8086 processor (3 Marks)

b. Explain the concept of pipelining in 8086. Discuss its advantages and disadvantages. (5 Marks)

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

d. Explain with example the following addressing modes

i. Indirect addressing
ii. Register addressing
iii. implied addressing (6 Marks)

QUESTION 5(20 Marks)

a. Explain the meaning of the following assembly language code:

```
mov AH, 01h
int 21h
```

(4 marks)

b. Explain with example the following addressing modes
i. direct
ii. immediate
iii. implied (6 Marks)

c. Write a program in assembly to print string "hey" in the screen (6 Marks)
d. Discuss three buses found in computer system (6 Marks)