

**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.**

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**INSTRUCTIONS: Answer Question ONE and any other TWO questions.**

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**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.  $DT/\bar{R}$
  - ii. HLDA
  - iii.  $M/\bar{IO}$  (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)