



TECHNICAL UNIVERISTRY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

UNIVERSITY EXAMINATION FOR DEGREE IN:
BACHELOR OF TECHNOLOGY IN INFORMATION TECHNOLOGY
(BTIT 12J – Y3 S2)

EIT 4306: SYSTEMS PROGRAMMING

END OF SEMESTER EXAMINATION
SERIES: DECEMBER 2014
TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*

This paper consists of **FIVE** questions. Attempt question **ONE (Compulsory)** and any other **TWO** questions
Maximum marks for each part of a question are as shown

This paper consists of **THREE** printed pages

Question One (Compulsory)

a) Outline the function of the following system development tools

- (i) Assembler
- (ii) Loader
- (iii) Linker

(6 marks)

b) Distinguish between the following terms:

- (i) Operation code and operand
 - (ii) Machine language and assembly language
 - (iii) Maskable and non-maskable interrupt
- marks)**

(6

c) State the major importance of interrupts

(2 marks)

d) Outline the purpose of the following registers in the 8086 microprocessor

- (i) Source index register
- (ii) Instruction pointer register
- (iii) Base pointer register

- e) With an aid of block diagram describe how the Direct Memory access data transfer is carried out in 8086
- f) Given below is a section of assembly language program:
 Move ax,5;
 add ax, 3;
 inc ax;
 dec ax;
 sub ax, 6;

Provide a brief explanation of each instruction and give the content of register ax at each step
 (5 marks)

Question Two

- a) List any FOUR advantages of assembly language (4 marks)
- b) Explain the function of bus controller in maximum mode operation of 8086 microprocessor (2 marks)
- c) Explain with example the following addressing modes:
 (i) Direct
 (ii) Immediate
 (iii) Implied (6 marks)
- d) Outline the fetch and execute cycle of 8086 CPU (8 marks)

Question Three

- a) List any THREE flags of a 8086 microprocessor Flag Register (3 marks)
- b) Explain the TWO separate units of the 8086 CPU (4 marks)
- c) Explain in brief the functions of the following 8086 pins:
 (i) MN/MX
 (ii) ALE
 (iii) INTA
 (iv) Ready
 (v) Reset
 (vi) BHE/ST (6 marks)
- d) Outline the interrupt process (7 marks)

Question Four

- a) Identify the function of following commands in assembly language:
 (i) MOV
 (ii) POP (4 marks)
- b) Outline the THREE types of programming languages (3 marks)
- c) Differentiate RISC and CISC processors (5 marks)
- d) Draw and explain the timing diagram of write cycle in 8086 in minimum mode (8 marks)

Question Five

- a) What is the difference between minimum and maximum modes of 8086 **(2 marks)**
- b) Describe the difference between a near and a far call. Explain why a far call takes longer to execute. **(4 marks)**
- c) Describe the following DMA controller data transfer options:
(i) Cycle steal
(ii) Hidden DMA
(iii) Burst Transfer **(6 marks)**
- d) List and describe the FOUR segment register of 8086 **(8 marks)**