TECHNICAL UNIVERISTY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

UNIVERSITY EXAMINATIONS FOR DEGREE IN:
BACHELOR OF TECHNOLOGY IN INFORMATION TECHNOLOGY
(BTIT BSIT)

EIT 4306: SYSTEMS PROGRAMMING

END OF SEMESTER EXAMINATION
SERIES: APRIL 2015
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 **TWO** printed pages

Question One (Compulsory)

a) Explain the function of the following assembler directives **(4 marks)**
   (i) Assume
   (ii) Org
   (iii) Ends
   (iv) DB

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) Maskable and non-maskable interrupts
   (iii) Maskable and non-maskable interrupts **(6 marks)**

d) Explain in brief the function of the following 8086 pins **(5 marks)**
   (i) ALE
   (ii) INTR
   (iii) Ready
   (iv) Rest
   (v) BHE/57

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 Two

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) Explain the following instructions with an example:
   (i) JMP
   (ii) LOOP
   (iii) CMP
   (iv) SUB
   (v) XCHG
   (vi) ADD **(6 marks)**

d) Describe the instruction format of the 8086 **(6 marks)**

Question Three

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 Four

a) Give any THREE miscellaneous instruction 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 Five

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: **(6 marks)**
   (i) RCL and RCR
   (ii) ADD and ADC
   (iii) ROL and ROR

d) Describe the steps of how the 8086 processor handles an interrupt once an interrupt signal is asserted in INTR pin **(8 marks)**