TECHNICAL UNIVERISTY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

UNIVERSITY EXAMINATIONS FOR DEGREE IN:
BACHELOR OF SCIENCE IN MATHEMATICS & COMPUTER SCIENCE (BMSC Y1 S2)

EIT 4154: COMPUTER ARCHITECTURE & ORGANIZATION

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 following terms:
   (i) Address Latch Enable
   (ii) Hardwired Computer
   (iii) DMA
   (iv) Virtual memory **(8 marks)**

b) Outline FOUR characteristics for each of the following processor architectures **(8 marks)**
   (i) RISC
   (ii) CISC

c) Explain THREE basic block replacement strategies **(6 marks)**

d) Explain TWO key parameters that determine the performance of microprocessors **(2 marks)**

e) Explain the functions of the following microcomputer components:
   (i) Input-output module **(2 marks)**
   (ii) Processor status word register **(2 marks)**

(iii) Program counter **(2 marks)**

Question Two

a) Explain the goals of memory hierarchy **(3 marks)**

b) With the aid of a diagram, describe the memory hierarchy **(7 marks)**

c) With the aid of a diagram, explain the signal groups of 8085 microprocessor **(10 marks)**

Question Three

a) List the status of the control lines in an 8085 microprocessor during:
   (i) Memory address operations **(2 marks)**
   (ii) Peripheral 1/0 operations **(2 marks)**

b) With reference to computer system, explain the significance of:
   (i) Memory interfacing **(2 marks)**
   (ii) Address decoding **(2 marks)**

c) Explain the following terms in the context of memory systems:

   (i) Latency
   (ii) Access time
   (iii) Miss rate
   (iv) Hit rate **(8 marks)**

d) Discuss any FOUR types of 8085 microprocessor addressing modes, giving examples **(8 marks)**

Question Four

a) Describe THREE factors that contribute to time required to access a file **(3 marks)**

b) With the aid of a diagram, describe 8085 registers **(9 marks)**

c) With reference to instruction types, distinguish between monadic and dyadic operations. Give ONE example of each type of operation **(4 marks)**

d) Using examples, explain the differences between data transfer and data manipulation instructions **(4 marks)**

Question Five

a) Explain the difference between a compiler and an interpreter **(3 marks)**

b) Write an assembly language program to perform addition of two 8-bit numbers **(5 marks)**

c) Explain the concept of memory mapped 1/0 **(3 marks)**

d) Distinguish between split cache and unified cache **(6 marks)**

e) Explain THREE ways of improving cache performance **(3 marks)**