TECHNICAL UNIVERSITY OF MOMBASA

INSTITUTE OF COMPUTING AND INFORMATICS

DEPARTMENT OF MATHEMATICS & PHYSICS

UNIVERSITY EXAMINATION FOR:

BACHELOR OF MATHEMATICS AND COMPUTER SCIENCE

EIT 4154: COMPUTER ARCHITECTURE AND ORGANIZATION

END OF SEMESTER EXAMINATION

SERIES: APRIL 2016

TIME: 2HOURS

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 **FIVE** questions. Attemptquestion ONE (Compulsory) and any other TWO questions.
Do not write on the question paper.

Question ONE

a) Write the following abbreviations in full.   (5 marks)
    i) BIOS
    ii) AGP
    iii) POST
    iv) EPROM
    v) CMOS

b) Define the following terms   (12 marks)
    (i) Computer architecture
    (ii) Single Core CPU

    (iii) Registers
    (iv) Computer organization
    (v) Computer Structure
    (vi) Computer Function

c) Suppose that we have two implementations of the same instruction set architecture. Machine A has a clock cycle time of 50 ns and a CPI of 4.0 for some program, and machine B has a clock cycle of 65 ns and a CPI of 2.5 for the same program. Which machine is faster and by how much?   (3 marks)

d) Using a diagram of a Von Neumann model/ Architecture explain the concept for designing and building computers.
                                      (10 marks)

Question TWO

a) Using an appropriate example, describe the concept of the CPU clock. (3 marks)

b) The motherboard is the olive green or brown circuit board that lines the bottom of the computer. Most of the time, motherboard fails and it failures commonly fall into three types or categories. State and explain them. (9 marks)

c) Explain the following characteristics of memory systems (8 marks)
- (i) Location
- (ii) Capacity
- (iii) Unit of Transfer
- (iv) Transfer rate

Question THREE

a) Highlight two advantages and two disadvantages of a cache memory. (4 marks)

b) State and explain the three components of the system buses. (6 marks)

c) Explain any two benefits that one will gain by upgrading a computer memory. (4 marks)

d) Most of this noise is of the computer is coming from the various fans inside the computer. State and explain the functions of any three fans inside the computer case. (6 marks)

Question FOUR

a) State and explain three reasons why an I/O device or peripheral device is not directly connected to the system bus. (6 marks)

b) Your PC has to keep certain settings in a CMOS when it's turned off and its power cord is unplugged. Highlight any four of these settings. (4 marks)

c) Briefly differentiate RISC machine from CISC machines. (4 marks)

d) Explain the following terms and state how they affect system performance. (6 marks)
- i) Bus width
- ii) Word size

Question FIVE

a) Differentiate between the ROM and RAM. (4 marks)

b) A chipset is a collection of chips or circuits that perform interface and peripheral functions for the processor. The functions of chipsets can be divided into two major functional groups. Name and explain these two major functional groups. (10 marks)

c) One of the most interesting, and most analyzed, aspects of computer design is instruction set design. The instruction set defines the functions performed by the CPU. The instruction set is the programmer's means of controlling the CPU. Thus programmer requirements must be considered in designing the instruction set. State and explain any three most important and fundamental design issues. (6 marks)