KENYA METHODIST UNIVERSITY

END OF 1ST TRIMESTER 2010 EXAMINATIONS

FACULTY	**:**	**COMPUTING AND INFORMATICS**
DEPARTMENT	**:**	**COMPUTER INFORMATION SYSTEMS**
UNIT CODE	**:**	**CISY 301**
UNIT TITLE	**:**	**COMPUTER ARCHITECTURE**
TIME	**:**	**2 HOURS**

Instructions:

- *Attempt question 1 and any other 2 questions.*

Question 1 (30 marks)

a) Historical development of computer systems can be separated into two eras. Briefly state these two eras and for each give two architectural features. (6 mks)

b) Define the following terms;
   i) Computer architecture
   ii) Computer organization
   iii) Interface
   iv) Registers
   v) Counters
   vi) Memory bandwidth

c) To accurately gauge system performance, applications programs must be considered. Briefly explain the three programs used for performance analysis. (6 mks)

d) The major functions for an I/O module fall into several categories. State five of these categories. (5 mks)

e) Briefly outline the general CPU instruction cycle and explain how an interrupt is handled by the instruction cycle. (5 mks)

f) Briefly explain what is meant by the terms function and structure. (2 mks)

Question 2 (20 marks)

a) In the context of computer system design where the hierarchical nature is essential to both the design and their description; outline the four levels of computer description and state what happens in each of the levels. (8 mks)

b) Bus lines are grouped depending on functions, state and briefly explain the three bus signal groups. (6 mks)

c) State three configuration approaches for I/O module in computer systems architecture. (3 mks)

d) What are some of the factors that affect the bus performance? (3 mks)

Question 3 (20 marks)

a) Briefly describe three characteristics of Von Neumann's architecture. (3 mks)

b) Memory references tend to be clustered in certain regions in within the computer system. This feature is known as the principle of locality, and it occurs in three dimensions. State and explain these dimensional factors on the principle of locality . (6 mks)

c) Explain four factors that will affect the performance of the Hard Drive. (4 mks)

d) Differentiate between;

   i) Pipelining and parallelism

   ii) Cache hit and Cache coherency (4 mks)

Question 4 (20 marks)

a) The classic RISC pipeline is broken into five stages with a set of flip flops between each stage. State the five stages. (5 mks)

b) List two advantages and two disadvantages of pipelining. (4 mks)

c) Describe the IDE channels. (4 mks)

d) Briefly explain what is meant by the following terms. (4 mks)

   i) Cache miss

   ii) Cache write back

   iii) Superscalar architecture

   iv) Interrupts

e) State three problems of using millions of instructions per second (MIPS). (3 mks)