



**JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY**  
INSTITUTE OF COMPUTER SCIENCE AND INFORMATION TECHNOLOGY  
FOURTH YEAR SECOND SEMESTER CONTINUOUS ASSESMENT TEST FOR THE AWARD OF A BACHELOR OF  
COMPUTER TECHNOLOGY DEGREE YEAR:NOV :: 2021

**BCT 2408 COMPUTER ARCHITECTURE**

**TIME: 1 HOUR**

**INSTRUCTIONS:** Answer All QUESTIONS

- (a) (i) Draw a block diagram depicting the basic instruction cycle and explain it (3 marks)  
(ii) Describe the three elements of a machine instruction (3 marks)
- (b) Differentiate between destructive and non-destructive read operations. In what type of memories are each of these two technologies used? (4 marks)
- (c) Some microprocessors today are designed to have adjustable voltage. A 20% reduction in voltage may result in a 20% reduction in frequency. What would be the impact on dynamic energy and power? (5 marks)
- (d) What strategies are used to deal with heat or hot spots on processors (4 marks)
- (e) The cost of memory viz-a-vis performance of the machine has always been an issue in the design of computing systems. Using a diagram, describe the memory hierarchy of a modern laptop / desktop computer and justify the need for hierarchy presented (6 marks)
- (f) Draw a state machine showing how a computer's ISA helps it to execute instructions from memory using core registers (5 marks)