MACHAKOS UNIVERSITY

University Examinations for 2021/2022

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

FIRST YEAR ……. SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (……) .

SIT 110: COMPUTER ORGANIZATION AND ARCHITECTURE

DATE: **TIME:**

INSTRUCTIONS: Answer Question ONE and any other TWO Questions

QUESTION ONE (COMPULSORY) (30 MARKS)

a) Differentiate between computer organization and computer architecture (4 marks)

b) Explain the following elements of a machine instruction

i. Operation code (2 marks)

ii. Source operand reference (2 marks)

iii. Result operand reference (2 marks)

c) Discuss any two reasons why one cannot directly connect peripherals to a system bus (4 marks)

d) Explain any five computer architecture attributes (5 marks)

e) Find the 2s Compliment of the following Fixed Point Numbers

i. 10100010 (3 marks)

ii. 00110000 (3 marks)

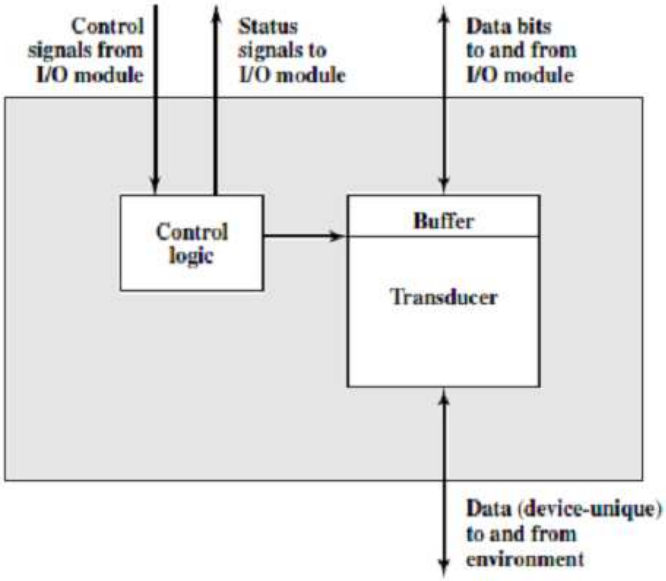
f) Using a well labeled diagram, explain the concept of von Neumann architecture (5 marks)

QUESTION TWO (20 MARKS)

a) Explain types of instruction set operations (4 marks)

b) Describe the four classes of interrupts (8 marks)

c) Discuss the diagram below showing a block diagram of an external device (8 marks)



QUESTION THREE (20 MARKS)

a) Differentiate between programmed i/o and interrupt driven I/O techniques (4 marks)
b) Discuss four characteristics of disk systems (8 marks)
c) List four disadvantages of using RAID level 5 technology (8 marks)

QUESTION FOUR (20 MARKS)

a) Discuss the four functions of the input/output module (8 marks)
b) Describe the following elements of bus design
   i. Bus type (2 marks)
   ii. Method of arbitration (2 marks)
   iii. Bus width (2 marks)
c) Year by year, the cost of computer systems continues to drop dramatically, while the performance and capacity of those systems continue to rise equally dramatically. Describe four factors that designers consider in ensuring there is risen performance in computer systems (6 marks)

QUESTION FIVE (20 MARKS)

a) Describe the following types of bus Architectures
   i. Small computer system interface (3 marks)
   ii. Extended industry standard architecture (3 marks)
   iii. Micro channel architecture (3 marks)
b) Using a well labeled diagram, explain memory hierarchy of computer systems (8 marks)
c) Differentiate between parallel and serial interfaces (3 marks)