MACHAKOS UNIVERSITY

University Examinations for 2019/2020 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

THIRD YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)

SIT 311: COMPUTER ARCHITECTURE

DATE: 9/11/2020 **TIME: 2.00-4.00 PM**

INSTRUCTIONS

Answer question ONE and any other TWO questions.

QUESTION ONE (COMPULSORY)

a) Complete the table below for a four bit binary signed-integer representation (10 marks)

Opearion	Binary number	Sign and magnitude representation	1's complement	2's complement
Digit Representation	0000	+0		
	1111	-7		
	1000	-0	-7	
		+3	+3	
Sum in (Decimal and binary)				

b) Draw an IAS structure of a computer (6 marks)

c) Define a cache memory and discuss Cache coherence problem (7 marks)

d) Explain three types of Instruction with examples (7 marks)

QUESTION TWO (20 MARKS)

a) Draw the block diagram of organization of 32-bit computer memory (8 marks)

b) Explain in detail about interrupt handling in computers (8 marks)

c) Differentiate between PCI and SCSI buses (4 marks)

QUESTION THREE (20 MARKS)

a) State four addressing modes (4 marks)

b) Given an equation A+B+C=D (6 marks)

i. Write the RTN

ii. Give the equivalent assembly language notation for RTN above

c) Define instruction and with example explain one, zero address instructions. (6 marks)

d) Draw the diagram of memory controller (4 marks)

QUESTION FOUR (20 MARKS)

a) Distinguish between big-endian and little-endian by use of diagrams (4 marks)

b) Discuss any four major functions of I/O module (8 marks)

c) Discuss virtual organizations including appropriate diagrams (8 marks)

QUESTION FIVE (20 MARKS)

a) Explain six execution steps including diagrams where appropriate (8 marks)

b) Compare and contrast RISC and CISC (6 marks)

c) Explain the fundamental limitations to parallelism (to which we apply compiler-based optimization and hardware techniques) (6 marks)