



MACHAKOS UNIVERSITY

University Examinations for 2020/2021 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

FIRST YEAR FIRST SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE IN MATHEMATICS AND COMPUTER SCIENCE

BACHELOR OF SCIENCE IN COMPUTER SCIENCE

SCO 104 COMPUTER ORGANIZATION AND ARCHITECTURE

DATE: 23/2/2021

TIME: 2.00-4.00 PM

INSTRUCTIONS

Answer question ONE and any other TWO questions.

QUESTION ONE (COMPULSORY) (30 MARKS)

- a) State the seven stages in Von Neumann fetch-execute cycle (7 marks)
- b) Using a well labelled diagram explain Von Neumann architecture of a computer.
- c) Explain a three-bus structure (6 marks)
- d) Differentiate (6 marks)
 - i. ISR and software routine
 - ii. I/O device and I/O module
 - iii. Software interrupts and polled interrupts
- e) Using a well labelled diagram, describe computer memory organization (6 marks)
- f) Perform the binary arithmetic $5.75_{10} + A_{16} + 01101100_{BCD} + 8_8$ (5 marks)

QUESTION TWO (20 MARKS)

- a) Explain the functional units of a computer (10 marks)
 - b) Discuss ways of handling multiple interrupts (6 marks)
 - c) State four advantages of RISC over CISC (4 marks)
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QUESTION THREE (20 MARKS)

- a) Compare and contrast DMA and programmed I/O (6 marks)
- b) Discuss the objectives of the following memories (6 marks)
 - i. Cache
 - ii. Virtual
- c) Define register and list the purpose of special purpose registers (8 marks)

QUESTION FOUR (20 MARKS)

- a) Compare and contrast linux and windows operating system architecture (8 marks)
- b) Describe the functions of an I/O module using a diagram (8 marks)
- c) Explain instruction pipelining (4 marks)

QUESTION FIVE (20 MARKS)

- a) Explain the Flynn Classification of processors (8 marks)
- b) Describe the methods of minimizing interrupts in computer buses (6 marks)
- c) Explain memory hierarchy (6 marks)