



MACHAKOS UNIVERSITY

University Examinations for 2021/2022

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

SECOND YEAR SPECIAL / SUPPLEMENTARY EXAMINATIONS FOR

BACHELOR OF SCIENCE (COMPUTER SCIENCE)

SCO201: COMPUTER ORGANIZATION II

DATE: 30/8/2022

TIME: 2.00-4.00 PM

INSTRUCTIONS:

Attempt Question One and Any Other Two questions in this paper

QUESTION ONE (COMPULSORY) (30 MARKS)

- a) Explain any four types of addressing modes (8 marks)
- b) Discuss Flynn's classification of Computer (8 marks)
- c) Explain the various instruction types with examples (9 marks)
 - i. Data transfer
 - ii. Data processing
 - iii. Program control instruction
- d) Discuss a three bus structure of processor organization using relevant example (5 marks)

QUESTION TWO (20 MARKS)

- a) Describe I/O Module including relevant diagrams (12 marks)
- b) Using a RAM organization diagram, Explain a 7 bit data and 4 bit address memory. (8 marks)

QUESTION THREE (20 MARKS)

- a) Explain fundamental issues in instruction set design (5 marks)
- b) Discuss instruction cycle state diagram including interrupt using relevant example (9 marks)
- c) A computer has 8GB of memory. Each word in the computer is 16 bytes. Calculate the number of bits required to address any single word. (4 marks)

QUESTION FOUR (20 MARKS)

- a) Draw a diagram of a functioning microprogrammed unit (5 marks)
- b) Define registers and explain register transfer language (5 marks)
- c) Given $A=54_{10}$, $B=77_8$
- i. Compute $A-B$ in 2's complement, is it overflow? why or why not? (5 marks)
- ii. Using diagram of full adder explain ALU operation for the arithmetic in (ii) (5 marks)

QUESTION FIVE (20 MARKS)

- a) Discuss a zero address machine by using example below (8 marks)

$$Y = \frac{A - B + C}{G + H}$$

- b) Briefly discuss the major steps followed in designing a computer. (8 marks)
- c) Differentiate between RISC and CISC (4 marks)