



MACHAKOS UNIVERSITY

University Examinations for 2018/2019

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

SECOND YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE (COMPUTER SCIENCE)

SCO 201: COMPUTER ORGANIZATION AND ARCHITECTURE II

DATE: 23/9/2019

TIME: 8:30 – 10:30 AM

INSTRUCTIONS:

Answer question **ONE** and Any other **Two** among the four selective questions

QUESTION ONE (COMPULSORY) (30 MARKS)

- a) Explain memory access methods (9 marks)
- b) Define a register and discuss register organization of a computer (8 marks)
- c) Draw the I/O module (7 marks)
- d) Explain the following terms (8 marks)
 - i) Computer Structure
 - ii) Addressing modes
 - iii) Computer Architecture
 - iv) Computer bus

QUESTION TWO (20 MARKS)

- a) Discuss the functions of a computer including the components that allow it to do so (7 marks)
- b) Using a RAM organization diagram, explain the organization of a RAM (8 marks)
- c) State any five functions of I/O module (5 marks)

QUESTION THREE (20 MARKS)

- a) Explain registrar transfer language using appropriate examples (7 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 hardwired control unit (5 marks)
- b) Discuss a three bus structure of processor organization using relevant example (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 (6 marks)

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

- b) Explain three challenges with CISC computers. (8 marks)
- c) State major characteristics of RISC (6 marks)