



MACHAKOS UNIVERSITY

University Examinations for 2020/2021 Academic Year

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: 10/8/2021

TIME: 2.00-4.00 PM

INSTRUCTION: Answer Question ONE and any other TWO Question

QUESTION ONE (COMPULSORY)

- (a) Using well labelled diagram, describe I/O Module (6 Marks)
- (b) Explain the following instruction types with examples (9 Marks)
 - (i) Data transfer
 - (ii) Data processing
- (c) Explain the following types of machines (6 Marks)
 - i. One address
 - ii. Two address
 - iii. Three address
- (d) Given the instruction $A+B=C$, Write machine equivalent instructions (6 Marks)
- (e) Any three condition flags (3 Marks)

QUESTION TWO

- a) Discuss interrupt enabled instruction cycle state using a diagram (8 Marks)
- b) Describe virtual memory (6 Marks)
- c) A computer has 8GB of memory. Each word in the computer is 16 bytes. Calculate
 - i. the number of bits required to address any single word (4 Marks)
 - ii. Number of memory partitions (2 Marks)

QUESTION THREE

- a) Explain any four types of addressing modes (8 Marks)
- b) Using a well labelled diagram, differentiate between parallel and pipelined ALUs (6 Marks)
- c) Describe cache memory (6 Marks)

QUESTION FOUR

- a) Draw a diagram of the following bus structures
 - i. Single (2 Marks)
 - ii. Multiple (4 Marks)
- b) Using relevant examples, explain RTL (5 Marks)
- c) Describe three I/O techniques (9 Marks)

QUESTION FIVE

- a) Draw a diagram of a functioning hardwired microprogrammed unit (6 Marks)
- b) Explain three parts of an instruction (6 Marks)
- c) Discuss branch prediction using a branch prediction state diagram (8 Marks)