



Machakos University

ISO 9001:2008 Certified

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

Supplementary Examination for Bachelor Science in Computer science

SCO 201

Computer Organization and Architecture II

Date:

Time: 2 HOURS

Instruction

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

Question one (Compulsory)

- (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

- 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

- 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:

- 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:

- 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)