



MACHAKOS UNIVERSITY

University Examinations for 2021/2022

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

FIRST YEAR SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE DEGREE IN COMPUTER SCIENCE

SCO 104: COMPUTER ORGAISATION AND ARCHTECTURE

DATE:

TIME:

INSTRUCTIONS:

Answer Question ONE And Any Other TWO Questions

QUESTION ONE (COMPULSORY) (30 MARKS)

- a) Subtract $(11010)_2 - (10000)_2$ using 1's complement and 2's complement method. (4 marks)
- b) Explain the basic components of Generic Computing system regardless of its internal architecture with practical real time examples (6 marks)
- c) Explain how DMA can improve the computers I/O speed. (4 marks)
- d) Describe the hierarchy of buses, bus signals and its functionalities. (4 marks)
- e) Differentiate between SRAM and DRAM. (4 marks)
- f) With reference to an instruction cycle,
 - i. Define an instruction cycle (2 marks)
 - ii. Explain the phases of Instruction cycle (3 marks)
 - iii. Highlight the basic instruction formats for IO, Register and Memory Reference instructions. (3 marks)

QUESTION TWO (20 MARKS)

- a) Identify two I/O interfacing techniques Computer organization? (2 marks)
- b) Identify the components of a computer system? (5 marks)
- c) List out the methodologies involved in handling Priority Interrupt. (2 marks)
- d) With the aid of a well labelled diagram, explain the Bus Interconnection Schemes (6 marks)
- e) Discuss the types of Interrupt (5 marks)

QUESTION THREE (20 MARKS)

- a) Highlight the importance of interfacing. (2 marks)
- b) Explain the various types of computer organizational pipelining. (6 marks)
- c) Explain the basic operations performed by the processor (4 marks)
- d) Sketch the internal organization of CPU out with its functionalities and block diagram. (8 marks)

QUESTION FOUR (20 MARKS)

- a) Explain how DMA can improve computer's I/O speed. (4 marks)
- b) With the aid of a neat diagram, illustrate a processor with multiple functional units. (4 marks)
- c) Describe Three approaches to achieving increased processor speed (6 marks)
- d) Identify the advantages of write through cache memory. (6 marks)

QUESTION FIVE (20 MARKS)

- a) Explain how to resolve multiple contentions in shared resources. (4 marks)
- b) With the aid of a well labelled diagram, explain the Basic Instruction Cycle (6 marks)
- c) Describe the classification of memory (6 marks)
- d) Identify the crucial features that can help in designing the instruction set architecture for a specific purpose processor (4 marks)