

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF DIPLOMA IN COMPUTER SCIENCE

COSC 0101: INTRODUCTION TO COMPUTER SYSTEMS

STREAMS: DIP. COMP SCI. Y1S1

TIME: 2 HOURS

DAY/DATE: TUESDAY 21/09/2021

2.30 P.M. – 4.30 P.M.

INSTRUCTIONS:

- Answer question **ONE** and **TWO** other questions
- Do not write anything on the question paper
- This is a **closed book exam**, no reference materials are allowed in the examination room
- There will be **NO** use of mobile phones or any other unauthorized materials
- Write your answers legibly and use your time wisely.
- Marks are awarded for clear and concise answers.

SECTION A

Question One [30 Marks]

- List the Three major components that make up a CPU [3 marks]
- List are the main features of von Neumann architecture [4 marks]
- Define a software. List Two types of software commonly used in today's world [4 marks]
- List and explain the THREE functions of Operating Systems [4 marks]
- Explain Integer representation in internal data representation [2 marks]
- How does a computer system represent data? [2 marks]
- List any Three types of storage devices [3 marks]
- Define the number system in computers. Give two common types of number systems [3 marks]
- Calculate the 2's complements of binary number 010111.1100 [2 marks]

- j. Explain the difference between RISC and CISC [3 marks]

SECTION B [Answer any TWO questions]

Question Two [20 Marks]

- a. Explain the following terms
- i. external data representation [2 marks]
 - ii. Marshaling [2 marks]
- b. Every day over a billion of people connect to the internet. What are they doing? provide four common uses and examples [8 marks]
- c. Briefly Outline the History of computers by generations [8 marks]

Question Three [20 Marks]

- a. List and explain any FOUR applications of Embedded systems in society [8 marks]
- b. List two methods of job scheduling done by operating systems and explain three techniques of each scheduling type [8 marks]
- c. Suppose that $n=8$ and the binary representation is 0 000 0000B. What is the integer? [4 marks]

Question Four (20 Marks)

- a. List Five Components of contemporary personal computer systems and their functions [10 marks]
- b. Solve the following number systems
- i. Represent 23 in the binary number system [2 marks]
10111
 - ii. binary multiplication $111_1 \times 10_2$ [2 marks]
1110
 - iii. 100101_2 to octal [2 marks]
45
 - iv. 10011101 to hexadecimal number [2 marks]
9D

- v. The range of the numbers which can be stored in an eight-bit register is [2 marks]
 – 128 to + 127

Question Five [20 Marks]

- a. Fig 5.1 below is a Von Neumann Machine with TWO Registers, explain the read and write steps [5 marks]

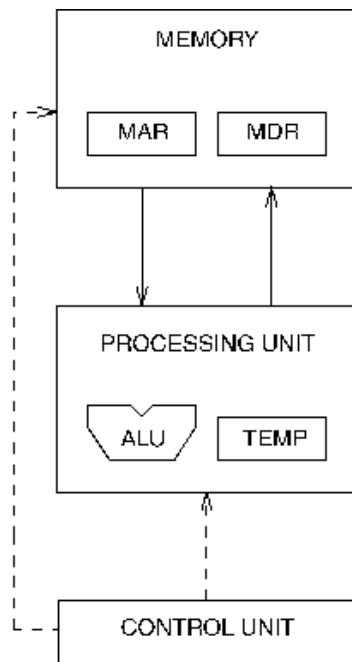


Fig 5.1

- b. Using a diagram, demonstrate the memory operations of a Von Neumann Model [10 Marks]
- c. With use of a diagram, show working of Von Neumann MAR/Memory Address Register circuitry [5 marks]