CHUKA   **UNIVERSITY**

UNIVERSITY EXAMINATIONS

FIRST YEAR EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE IN COMPUTER SCIENCE

COSC 101: INTRODUCTION TO COMPUTER SYSTEMS

STREAMS: BSC (COMPUTER SCIENCE) Y1S1   **TIME: 2 HOURS**

DAY/DATE: MONDAY 03/12/2018   **8.30 A.M. – 10.30 A.M.**

INSTRUCTIONS:
- **Answer question 1 and any other two**

SECTION A: Answer all questions in this section

QUESTION ONE (30 Marks)

a) Describe the purpose of the **TWO** essential registers in memory read and write operations.   **[4 marks]**
b) The Program Counter (PC) and Instruction Register (IR) are used in fetching an instruction for execution. Outline the sequence of events in this case.   **[4 marks]**
c) Any instruction issued by the processor must carry at least two types of information. Describe this information.   **[4 marks]**
d) Describe data encoding in digital computers highlighting commonly used encoding schemes.   **[4 marks]**
e) Write a generic query in SQL that retrieves all the records of all students taking COSC101 from a table named STUDENTS.   **[3 marks]**
f) Differentiate between Functions and Formulas as used in spreadsheet applications giving an example for each.   **[4 marks]**
g) Differentiate between network Protocols and Topologies as used in computer networks giving **TWO** examples for each.   **[4 marks]**
h) Outline any **THREE** advantages of databases.   **[3 marks]**

SECTION B (Answer any TWO questions from this section)

Question Two (20 marks)

a) With the aid of a well labeled diagram, explain the Three-Bus datapath. **[6 marks]**
b) Explain any **TWO** salient features that make word processors effective for the purpose of creating text files. [**4 marks**]
c) Discuss the any **THREE** contributions of high speed computing and computer networks in national development today. **[6 marks]**
d) Using an example, explain any **FOUR** commands commonly used in Linux/ Unix environment for file and directory management. **[4 marks]**

Question Three (20 marks)

a) Outline the sequence of events in fetching an instruction. **[4 marks]**
b) Discuss the techniques used in selecting cache blocks in case of cache full. **[6 marks]**
c) Discuss the various technologies used in making storage media**. [6 marks]**
d) Outline the sequence of events in handling an interrupt. **[4 marks]**

Question Four (20 marks)

a) Consider the arithmetic operation **Add R_1, R_2, R_0** and the times t_0, t_1, and t_2, where $t_0 < t_1 < t_2$. Show the number of the steps the instruction would take using:
    i.   One-bus datapath. **[3 marks]**
    ii.   Two-bus datapath. **[2 marks]**
    iii. Three-bus datapath. **[3 marks]**

b) Discuss any **THREE** objects in Ms. ACCESS used in creating databases. **[6 marks]**
c) Differentiate between RISC and CISC computer architectures**. [6 marks]**

Question Five (20 marks)

a) Using a diagram, describe the Direct (Absolute) memory addressing mode. **[4 marks]**
b) Distinguish between spatial and temporal locality in memory design. **[4 marks]**
c) Describe the purpose of each general purpose register in a processor. **[6 marks]**
d) Discuss **THREE** IT revolutions shaping the world today. **[6 marks]**