CHUKA   **UNIVERSITY**

UNIVERSITY EXAMINATIONS

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

COSC 475: SPECIAL TOPICS IN COMPUTER SCIENCE

STREAMS: BSC COMPUTER SCIENCE   **TIME: 2 HOURS**

DAY/DATE: THURSDAY 23/09/2021   **8.30 A.M – 10.30 A.M.**

INSTRUCTIONS:
- **Answer question ONE and any other TWO.**

QUESTION ONE :30 MARKS

a) Discuss the layered architecture of an android operating systems   (4 marks)
b) Why is big data here to stay and even take predominance in the future?   (4 marks)
c) Discuss the Hadoop Distributed File System (HDFS)   (4 marks)
d) Explain Software as a Service (SaaS), Infrastructure as a Service (IaaS) and Platform as a Service (PaaS) models of Cloud Computing.

(4 marks)

e) Blockchain has drawn attention as the next-generation financial technology due to its Security that suits the informatization era. Justify the statement and also explain its challenges with appropriate examples.   (4 marks)

f) How can you send and receive SMS from within your own application without using built-in SMS application of android. Explain with the help of program

(5marks)

g) There are three potential methods to implement parallel I/O: 1) One process performs I/O operations for all other processes; 2) Each process reads or writes the data from or to a separate file; 3) Different processes access different parts of a common file. Discuss the

advantages and disadvantages of each method. Which method of parallel I/O is most widely used nowadays and why?   (5 marks)

SECTION B

QUESTION TWO: 20 MARKS

a) What are the various operational modes of Hadoop .cluster configuration and explain in detail about configuring/installing Hadoop in fully distributed mode.(6marks)

b) What is Big data analytics ? Describe at least Five Top big data analytics tools
                                                                                (5 marks)

c) How does google file system does differs from the Hadoop file system and explains the google file system architecture with a neat sketch?   (3 marks)

d) Explain the following problems that Bitcoin technology must overcome:
  i)   No intrinsic value   (2mark)
  ii) Creation of Huge hardware competition   (2marks)

e) Differentiate between program slicing and program profiling as used in software tesing   (4 marks)

QUESTION THREE:20 MARKS

a) Discuss "internet minute " in relation to Big data by use of relavant examples (5 marks)

b) "I think [block chain] is a fascinating area to keep an eye out for, but I think it's being over-hyped right now… from the aspect of its short-term impact because there are still technical things that you need to solve and scale and there are still counter-aspects – business model wise – that aren't necessarily fully clear."

What is your take on the statement by bringing out a proper and deep support for or against the statement with clear and well explained examples   (5marks)

c) Discuss the difference between Cluster systems and Grid systems.   (5 marks)

d) Explain the need for High performance computing   (5 marks)

QUESTION FOUR:20 MARKS

a) What are the likely problems that cryptocurrency poses to the financial sector in the future?   (5 marks)

b) Differentiate between process virtual machines, host VMMs and native VMMs   (3 marks)

c) It's important for companies to formally establish and publish their policies regarding forensic investigations.

i)   Give 4 (four) aspects or areas where these policies should address   (4marks)

ii)   Give 4 (four) benefits that the company can get from establishing these(4 marks)

d) Discuss Trust issues in the cloud computing and explain how they can be addressed .

(4marks)

QUESTION FIVE:20 MARKS

a) Discuss the Digital Investigation Process Model (DIPM)   (5 marks)

b) What are users' incentives to switch from traditional baking system to public blockchain?

(5 marks)

c) Discuss the main components of IoT architecture. Use a diagram to show the relationship and coordination between them   (5 marks)

d) The topology of node interconnection plays an important role in the performance of a Cluster system. Draw the topology of a 4-D hypercube. What are the values of node degree and bisection width of the topology? Discuss which aspect of network performance node degree and bisection width represent.   (5 marks)