CHUKA   **UNIVERSITY**

UNIVERSITY EXAMINATIONS

SECOND YEAR EXAMINATION FOR THE AWARD OF DIPLOMAIN COMPUTER SCIENCE

COMP 0274: EMERGING TECHNOLOGIES IN COMPUTER SCIENCE

STREAMS: DIP. COMPSCI Y2S2   **TIME: 2 HOURS**

DAY/DATE:WEDNESDAY 13/12/2017   **11.30 A.M – 1.30 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.**

QUESTION ONE (30 Marks)

a. Describe each of the following terms: (10 Marks)
   i. Internet of Things
   ii. Big Data
   iii. Virtual Reality
   iv. Cloud Computing
   v. Machine Learning
b. Explain the difference between batch processing and real-time processing as used in Big Data   (6 Marks)
c. While providing examples in each, state and explain THREE cloud computing models
                                                                       (9 Marks)
d. Distinguish between a data lake and a data warehouse   (2Marks)
e. While giving reasons, which emerging technology can be used to innovate technological solutions in Kenya today.   (3 Marks)

SECTION B (Answer any TWO questions)

QUESTION TWO (20 Marks)
    a. Sensory displays are used to display the simulated virtual worlds to the user. State and explain THREE sensory devices in virtual reality   (8Marks)

    b. Apart from OpenSimulator, list FOUR examples of Virtual Reality development tools
    (4 Marks)

    c. Chuka University is in the process of developing a virtual tour of the campus. As the system administrator, explain why OpenSimulator is the best choice of a virtual reality development tool.   (6 Marks)

    d. Explain two negative effects of virtual reality on human beings.   (2 Marks)

QUESTION THREE (20 Marks)
    a. Briefly discuss the FOUR general categories of activities involved with big data processing   (16 Marks)

    b. Explain the ETL process as used in big data.   (4 Marks)

QUESTION FOUR (20 Marks)

    a. Discuss the framework of four common communication models used by IoT devices.
    (8 Marks)

    b. IoT devices tend to differ from traditional computers and computing devices in important ways that challenge security. Discuss FIVE security related issues that relate to IoT.
    (10 Marks)

    c. List any two applications of IoT in the world today.   (2 Marks)

QUESTION FIVE (20 Marks)
    a. State and explain THREE benefits of cloud computing   (6 Marks)
    b. Discuss each of the following FOUR major cloud computing challenges   (8 Marks)
        i. Data Protection
        ii. Data Recovery and Availability
        iii. Management Capabilities
        iv. Regulatory and Compliance Restrictions

    c. Explain each of the following types of clouds: (6 Marks)
        i. Public Cloud
        ii. Private Cloud
        iii. Hybrid Cloud