

**UNIVERSITY EXAMINATIONS****SECOND YEAR EXAMINATION FOR THE AWARD OF DIPLOMA IN  
COMPUTER SCIENCE****COSC 0274: EMERGING TECHNOLOGIES IN COMPUTER SCIENCE****STREAMS: DIP. COMPSCI Y2S2****TIME: 2 HOURS****DAY/DATE: FRIDAY 07/12/2018****2.30 P.M – 4.30 P.M**

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**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: (8 Marks)
  - i. Internet of Things
  - ii. Blockchain
  - iii. Virtual Reality
  - iv. Cloud Computing
- b. While providing examples in each, state and explain THREE cloud computing models (9 Marks)
- c. Blockchain is the underlying foundation for the Bitcoin cryptocurrency. State and explain THREE advantages of Bitcoin over current transaction systems (6 Marks)
- d. While giving reasons, explain how two emerging technologies can be used to innovate technological solutions in Kenya today. (4 Marks)
- e. List THREE examples of IOT applications in the world 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 (8 Marks)
- 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. List any two negative effects of virtual reality on human beings. (2 Marks)

**QUESTION THREE (20 Marks)**

- a. Discuss FOUR key characteristics of a blockchain network. (8 Marks)
- b. Describe any TWO use cases of blockchain technology in the industries today. (4 Marks)
- c. Blockchain has the potential for revolutionizing business networks, briefly discuss each of the following key concepts of a blockchain. (8 Marks)
  - i. Shared Ledger
  - ii. Permissions
  - iii. Smart Contract
  - iv. Consensus

**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)
- a. Discuss FOUR major cloud computing challenges (8 Marks)
- b. Explain each of the following types of clouds: (6 Marks)
  - i. Public Cloud
  - ii. Private Cloud
  - iii. Hybrid Cloud