



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

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