MACHAKOS UNIVERSITY

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

FIRST SEMESTER, 2021/2022 ACADEMIC YEAR

FIRST YEAR SUPPLIMENTARY EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN CLOUD COMPUTING AND INFORMATION SECURITY

SCC 101: OVERVIEW OF IOT COMMUNICATION TECHNOLOGIES

DATE: _____   **TIME:** 2 HRS

EXAMINATION SESSION: FEB   **YEAR** 2022

INSTRUCTIONS

i)   **Answer question ONE and any other TWO questions**

ii)   **Write on both sides of the answer sheet**

iii)   **Do not write in the margins of the answer booklet**

QUESTION ONE (30 marks, Compulsory)

a) Define

i)   Sensor   **(2 marks)**

ii) Edge Computing   **(2 marks)**

iii) Cloud computing   **(2 marks)**

iv) Smart devices   **(2 marks)**

b) What are the requirements to connect a smart device to a home wireless network?

(2 marks)

c) Explain the main features of the following

i)   Arduino Board   **(2 marks)**
ii) micro-controller   **(2 marks)**
iii) Automation   **(2 marks)**
iv) Actuator   **(2 marks)**

d) Describe four key components of an IOT system   **(6 marks)**

e) Applications for IoT extend across a broad variety of use cases and verticals. However, all complete IoT systems are the same in that they represent the integration of four distinct components. Describe how an IOT system works by describing these components and how they are integrated **(6 marks)**

QUESTION TWO (20 MARKS)
a) Describe the importance of APIs in IOT applications **(6 marks)**

b) IOT Systems may operate without the need for cloud computing. However, there are substantial benefits if data processing and commanding take place in the cloud via an internet connection. Briefly describe these benefits. **(6 marks)**

c) Describe four key components of an IOT system **(8 marks)**

QUESTION THREE (20 MARKS)
a) There are numerous applications where the Internet of Things can be used. Choose any FOUR application areas of IOT in Kenya and explain the role IOT plays.
(10 marks)
b) Explain any FIVE factors to consider when choosing an IOT Platform **(10 marks)**

QUESTION FOUR (20 MARKS)
a) Briefly describe important IOT standards that IoT enabled devices must comply with.
(8 marks)
b) There are many and diverse job careers in IoT field. Briefly explain any FOUR job designations for an IOT specialist **(4 marks)**
c) Applications for IoT extend across a broad variety of use cases and verticals. However, all complete IoT systems are the same in that they represent the integration of four distinct components. Describe how an IOT system works by describing these components and how they are integrated **(8 marks)**

QUESTION FIVE (20 MARKS)
a) A company plans to add many more devices as part of an IoT solution. Explain three challenges that the company is likely to face because of this rapid growth of digitization. **(6 marks)**

b) Explain the advantages and disadvantages of IOT Systems **(6 marks)**

c) No complete IoT solution can be built without some kind of hardware. Choices about the hardware affect everything downstream, from the connectivity you choose, to the analytics you're able to provide, and to the interactions and interfaces that you enable for end-users. Describe some important factors you need to consider in your choice of IOT hardware. **(8 marks)**