



# **MACHAKOS UNIVERSITY**

**University Examinations for 2022/2023**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY**

**SECOND YEAR FIRST SEMESTER EXAMINATION FOR**

**BACHELOR OF SCIENCE (CLOUD COMPUTING AND INFORMATION  
SYSTEMS)**

**SCC203: COMPUTER NETWORK PRINCIPLES**

**DATE:**

**TIME:**

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**INSTRUCTIONS: Answer Question ONE and other TWO Questions**

## **QUESTION ONE (COMPULSORY) (30 MARKS)**

- a) Explain the difference between a LAN and WAN (4 marks)
- b) Define the following terms:-
  - Router (2 marks)
  - Repeater (2 marks)
  - Switch (2 marks)
- c) Define the term DHCP (2 marks)
- d) Differentiate between TCP and UDP (4 marks)
- e) A variety of devices are used in networking and internetworking. State any TWO devices and their functions. (4 marks)
- f) Discuss THREE types of transmission modes (6 marks)
- g) Differentiate between an intranet and extranet (4 marks)

## **QUESTION TWO (20 MARKS)**

- a) With the aid of a diagram explain the functions of the seven layers of the OSI model

- (8 marks)
- b) Discuss THREE causes of data transmission impairment (6 marks)
- c) i. Define the term 'switching' ? (2 marks)
- ii. Explain why the switching concept was developed (4 marks)

### **QUESTION 3 (20 MARKS)**

- b) i) Define the term 'Guided Media' (2 marks)
- ii) Discuss THREE types of guided media (6 marks)
- c) i) Define the term 'Multiplexing' (1 mark)
- ii) Mention two advantages of multiplexing (2 marks)
- d) Discuss THREE types of switching modes (6 marks)
- e) Communication through circuit switching is made up of THREE phases. List these phases. (3 marks)

### **QUESTION 4 (20 MARKS)**

- a) Explain how data is transmitted over a fiber optic cable. (4 marks)
- b) Identify TWO advantages of fiber optic cables over CAT 6 cables. (3 marks)
- c) Describe THREE basic security threats and solutions to both small and large computer networks. (6 marks)
- d) i. Define a firewall (1 mark)
- ii. State THREE advantages of using a firewall in a network. (3 marks)
- e) i. Define a VPN (1 mark)
- ii. Identify TWO uses of a VPN (2 marks)

### **QUESTION 5 (20 MARKS)**

- a) James has been tasked to set up and link two local area networks in different buildings which are separated by a distance of 150 meters. Discuss the requirements for setting up the two networks and how they can be linked together. (8 marks)
- b) The two networks above need access to the internet. Explain the equipment needed for each computer within the two LANs to access the internet ? (6 marks)
- c) i. Define 'NIC' ? (1 mark)
- ii. State THREE functions of this device. (3 marks)

d) Explain the difference between a hub and a switch

(2 marks)