



Machakos University

University Examinations 2022/2023

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

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

Date: DECEMBER

Time:

Instructions

This Paper consists of FIVE questions

Answer question ONE and any other TWO questions in this paper

QUESTION ONE (30 Marks).

- a) Distinguish Baseband and Broadband technologies in data communication (4marks)
- b) Discuss THREE fundamental characteristics on which the effectiveness of data communication depends on (6 marks)
- c) Distinguish Asynchronous Transmission from Synchronous transmission as modes of Data transmission (4 marks)
- d) Explain Four components of data communication. (4 marks)
- e) Explain any two types of Collision Domains in Ethernets. (4marks)
- f) Explain the following Types of Switching techniques. (3marks)
 - i. Circuit switching
 - ii. Packet switching
 - iii. Message switching
- g) Using a diagram describe how Virtual Circuit Switched Communications Work (5marks)

QUESTION TWO (20 Marks).

- a) Using a well labeled diagram, Explain OSI model (8 marks)
- b) As an IT expert you are required to advise an organization on the factors to consider when choosing an ISP .Discuss three factors (6 marks)
- c) State any THREE levels of addresses used in an internet employing the TCP/IP protocols (3 marks)
- d) Distinguish Transmission time from propagation time as used in flow Control protocols (3 marks)

QUESTION THREE (20 Marks).

- (a) Define the following terms as used with data communications (4 marks)
- (i)Bandwidth
 - (ii) Throughput
- b) using appropriate examples ,discuss Half Duplex and Full Duplex mode of data transmission (6 marks)
- (c) Explain three services offered by the datalink layer (6 marks)
- d) Distinguish fiber optic cable from coaxial cable (4 marks)

QUESTION FOUR (20 Marks).

- a) Describe FIVE routing protocols (10 marks)
- b) Explain the functions of the following networking components and devices (10 marks)
- i. Hub
 - ii. Gateways
 - iii. Routers
 - iv. Switches
 - v. Modem

QUESTION FIVE (20 Marks).

- a) Briefly discuss Three main differences between TCP (Transmission Control Protocol) and UDP (User Datagram Protocol). (6 marks)

- b) State four cellular technologies used in mobile phones (4marks)
- c) Explain three data transfer modes of HDLC (6 marks)
- d) Distinguish peer to peer and client – server based as means of accessing network (4 marks)