



KENYATTA UNIVERSITY

**EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN
COMPUTING AND INFORMATION TECHNOLOGY**

SCO 105: DATA COMMUNICATION TECHNOLOGIES

2ND SEMESTER 2023/2024

TIME: 2HOURS

INSTRUCTIONS: Answer Question ONE and any TWO Questions.

Question One

- (a) Explain the three basic hardware components of a data communication network. (6 marks)
- (b) Define the following terms
 - i. Routing
 - ii. Quantization
 - iii. Half-duplex
 - iv. Point-to-Point
 - v. Packetizing(5 marks)
- (c) With reference to the Internet model, layers can be grouped into three groups, explain these three groups. (6 marks)
- (d) Using a simple illustration, explain bipolar: return to zero voltage technique. (7 marks)
- (e) With aid of simple diagram explain the 3-tier client-server architecture. (6 marks)

QUESTION TWO

Kiamoka tea factory is factor that processes tea in our country. It has several branches spanning across the country and the neighboring countries. The factory has established network that connects the head office with all other branches. The factory is in the process of cutting down the cost and tries to make the factory profitable. You have proposed to the management that they consider the cloud computing technology.

- a. Discuss the two reasons that you considered when you propose to the management the need to adopt the cloud computing technology. (6 marks)
- b. With reference to the thin client-server architecture discuss the three cloud-based architecture models. (14 marks)

QUESTION THREE

The management of Sunlaw Seeds Company has decided to computerize their operations by introducing a number of information systems. Further the organization has decided to introduce a local area network so as to share its information. Assume you have been employed as an information systems security officer. Part of your responsibilities shall be required to maintain the security of the company's network. Discuss how you will go about in performing the risk assessment for your network.

(20 marks)

QUESTION FOUR

- (a) With aid of a suitable diagram, discuss the basic architecture of the packet-switched network. (6 marks)
- (b) Although the packets in one data stream may mix with several other data streams during their journey, it is unlikely that packets from two different data streams will travel together during the entire length of their transmission. The two communicating computers do not need to know through which intermediate devices their data are routed because the packet network takes care of it. There are two methods that the packet network takes care of this. Discuss the two methods. (6 marks)
- (c) Discuss any two ways one can use to improve MAN/WAN performance (8 marks)

Question FIVE

- (a) With aid of a suitable diagram discuss the topology of the Fiber-Distributed Data Interface (FDDI). (8 marks)
- (b) Discuss the four ways in which the computers attached to the Virtual LAN (VLAN) switches can be assigned to the specific VLANs inside them. (12 marks)