



KENYATTA UNIVERSITY

EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE

(COMPUTER SCIENCE)

SCO 401: NETWORK MANAGEMENT

2ND SEMESTER 2023/2024

TIME: 2HOURS

INSTRUCTIONS: *Answer question ONE and any other TWO questions*

QUESTION ONE (30 MARKS)

A university library is opening an off-campus branch that will connect to the university LAN through a point-to-point wireless solution. It will offer users' access to both public Wi-Fi and wired network. The library management system is available to users, but the server is maintained at the main university server room.

- a. Identify four key network management challenges for this university library (4 marks)
- b. Outline four types of access control mechanisms applicable for the library (4 marks)
- c. Discuss five security issues associated with transfer of data in this scenario (5 marks)
- d. Describe three recommendations for the most secure mechanism of data transfer, describing how each mechanism will be implemented. (6 marks)
- e. Justifying your answer, describe three network management tools the library network administrator will use in this case. (6 Marks)
- f. Outline five criteria the university can use when selecting an ISP for the library (5 marks)

QUESTION TWO (20 MARKS)

- a. Outline four challenges of using directory-enabled networking management (4 marks)
- b. Describe three key failure recovery mechanism in a particular network (6 marks)
- c. Using a diagram explain the architecture of a network management system and explain each of its key elements (6 marks)
- d. Explain two ways as to how viruses can slow a network (4 marks)

QUESTION THREE (20 MARKS)

- a. Briefly explain, with the use of an appropriate diagram:
 - i. The implementation of the Domain Name Service (DNS). (4 marks)
 - ii. How DNS queries are resolved in the DNS system with recursive and iterative queries. (6 marks)
- b. Using examples explain three methods how network management can help a service provider increase revenue (6 marks)
- c. Explain how QoS can be used to improve the network performance of real time and streaming protocols. (4 marks)

QUESTION FOUR (20 MARKS)

A company monitors their network using Simple Network Management Protocol (SNMP).

- a. Describe how they have implemented the SNMP (6 marks)
- b. Explain, in the context of this scenario, how the protocol will be used to monitor traffic for their router. (6 marks)
- c. Outline the various SNMP security levels (4 marks)
- d. Describe four Network Management functional groupings the company can deploy (4 marks)

QUESTION FIVE (20 MARKS)

QoS allows applications to request and receive predictable service levels in terms of bandwidth, latency variations (jitter), and delay.

- a. Briefly explain the terms bandwidth, jitter and delay. (6 marks)
- b. Describe the main behaviour of both Integrated Services (IntServ) and Differentiated Services (DiffServ) QoS architectures. (6 marks)
- c. Explain how QoS manages to regulate Service Level Agreement (SLA) within an organisation (4 marks)
- d. Three ways how bridge filters packets at MAC Addresses level and identifying at what layer of the OSI network model it operates (4 marks).