# UNIVERSITY EXAMINATIONS
# 2021/2022 ACADEMIC YEAR

# SPECIAL/SUPPLEMENTARY EXAMINATIONS
# YEAR FOUR SEMESTER TWO

# FOR THE DEGREE OF
# BACHELOR OF COMPUTER SCIENCE

**COURSE CODE : CSC 474E**

**COURSE TITLE: NETWORK PERFORMANCE & OPTIMIZATION (B)**

**DATE: 24/11/22      TIME: 08.00 A.M – 10.00 A.M**

## INSTRUCTIONS TO CANDIDATES

ANSWER QUESTIONS ONE AND ANY OTHER TWO.

## QUESTION ONE (COMPULSORY) [30 MARKS]

a) What is Round Trip Time (RTT) [2 marks]

b) Discuss the following network characteristics relevant for measurement.

    i.    Bandwidth [2 marks]

    ii.   Latency [2 marks]

    iii.  Throughput [2 marks]

    iv.  Jitter [2 marks]

c) Identify and explain two basic approaches for network monitoring [2 marks]

d) How can path detection tools be used to measure RTT to a specific hop? [3 marks]

e) Why is it that Probe Rate Model (PRM) has a larger overhead as compared to the Probe Gap Model (PGM)? [3 marks]

f) As a network architect for an organization, discuss atleast two (2) measurement tools dedicated to measure each of the following network characteristics:

    i.    Latency [4 marks]

    ii.   Path Detection [4 marks]

    iii.  Bandwidth [4 marks]

## QUESTION TWO [20 MARKS]

a) Define Network performance [2 marks]

b) Differentiate between bandwidth and throughput. [3 marks]

c) As a Network/system administrator for Kibabii University, why do you think it's important to measure network performance? [3 marks]

d) Discuss the key factors affecting network performance at the core, distribution and access layers of the hierarchical design. [8 marks]

e) Discuss the following terms as used in network performance

    i.    Packet shaping [2 marks]

    ii.   File compression [2 marks]

## QUESTION THREE [20 MARKS]

a) Define SMB protocol [2 marks]

b) Explain the benefits of SMB 2.0 [6 marks]

c) SMB is available for use in the Windows and UNIX environment in the provision of provide resource-sharing services. Describe any six (6) functionalities of Microsoft SMB Protocol.

[6 marks]

d) Discuss the SMB Protocol Authentication process. [6 marks]

## QUESTION FOUR [20 MARKS]

a) Discuss the following terms as used in Multi-Tier Client-Server applications

    i. Client-Server architecture [2 marks]

    ii. Distributed Network [2 marks]

b) Discuss the advantages and disadvantages of Multi-Tier Architectures [6 marks]

c) Discuss the different types of routing protocols. [4 marks]

d) Differentiate between routing protocol and routed protocol. [6 marks]

## QUESTION FIVE [20 Marks]

a) Discuss each of the following DTN terminologies.

    i. Delay-Tolerant Network [2 marks]

    ii. Bundle Protocol [2 marks]

b) There is a proposition that, "Design for speed, not for bandwidth optimization". Justify this statement. [8 marks]

c) Discuss the key Challenges of Optimization. [8 marks]