



(Knowledge for Development)

KIBABII UNIVERSITY

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]