



MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY

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UNIVERSITY EXAMINATIONS 2023/2024

SECOND YEAR, SECOND SEMESTER EXAMINATION FOR THE DEGREE OF
BACHELOR OF BUSINESS INFORMATION TECHNOLOGY, BACHELOR OF SCIENCE
IN INFORMATION TECHNOLOGY

AND

THIRD YEAR, SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR
OF INFORMATION SCIENCE, BACHELOR OF SCIENCE IN COMPUTER SCIENCE AND
BACHELOR OF SCIENCE IN COMPUTER SECURITY AND FORENSICS

CIT 3253: NETWORK ADMINISTRATION AND MANAGEMENT

DATE: APRIL 2024

TIME: 2 HOURS

INSTRUCTIONS: Answer Question ONE and any other TWO questions.

QUESTION ONE (30 MARKS)

- a) Explain four network security threats on modern networks (4 Marks)
- b) Describe four major roles of a network administrator (4 Marks)
- c) Define media access control and give two examples (4 Marks)
- d) Give four networking protocols and explain how these protocols enable devices to access local and remote network resources. (4 Marks)
- e) Define modulation and describe three modulation techniques (4 Marks)
- f) Explain how media access control in the data link layer supports communications across networks. (4 Marks)
- g) Explain how Ethernet operates in a switched network. (3 Marks)



MUST is ISO 9001:2015 and



ISO/IEC 27001:2013 CERTIFIED

- h) Explain how routers use network layer protocols and services to enable end-to-end connectivity. (3 Marks)

QUESTION TWO (20 MARKS)

- a) Design a small enterprise network and implement initial settings on a router and end devices. (4 Marks)
- b) Using a chat and table, calculate an IPv4 subnetting scheme to efficiently segment a class C network. (4 Marks)
- c) Explain two command prompt tools used to test network connectivity. (4 Marks)
- d) Compare the operation of transport and network layer protocols in supporting end-to-end communication. (4 Marks)
- e) Explain four fundamental principles governing Linux operating system [n/w support] (4 Marks)

QUESTION THREE (20 MARKS)

- a) Describe four server implementations of Linux (4 Marks)
- b) Define Encoding and explain four encoding standards using a diagram (4 Marks)
- c) Illustrate and explain the fields within an ethernet frame (4 Marks)
- d) with the use of a diagram, explain how the components in a fame relay network operate (4 Marks)
- e) explain the two frame forwarding methods on switches (4 Marks)

QUESTION FOUR (20 MARKS)

- a) Define the term clock slip and recommend three solutions to this problem (4 Marks)
- b) Discuss the distinguishing features of switches, routers and hubs (6 Marks)
- c) Describe two types of duplex settings used for communications on an Ethernet network (4 Marks)
- d) Explain then features of the following: (6 Marks)



- i. Unicast mac address
- ii. Broadcast mac address
- iii. Multicast mac address

QUESTION FIVE (20 MARKS)

- a) Using Claude Shannon's communication model, develop a communication system which utilizes bit values to send Morse code signals of 4 weather states between Meru and Nairobi using the fewest number of bits. From this model: (6 Marks)
 - i. Include an error detection and correction mechanism
 - ii. Draw a Huffman tree
 - iii. Calculate the entropy limit
- b) Discuss any two error correction and detection mechanisms (4 Marks)
- c) Linux is Unix-like but is NOT Unix. Explain this statement (4 Marks)
- d) Explain the role of FDDI in an enterprise network (3 Marks)
- e) Explain scenarios where UDP is preferred over TCP and explain how each works (3 Marks)

