



**DEDAN KIMATHI UNIVERSITY OF TECHNOLOGY
UNIVERSITY EXAMINATIONS 2020/2021 ACADEMI YEAR
THIRD YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR
OF SCIENCE IN TELECOMUNICATION AND INFORMATION ENGINEERING**

ETI 2206: NETWORK DESIGN AND MANAGEMENT

DATE: 22ND SEPTEMBER 2021

TIME: 8:30-10:30AM

Instructions: Attempt questions one and any other two questions.

QUESTIONS ONE (COMPULSORY)-(30 MARKS)

- a) Explain each of the following **(6 Marks)**
- i. Converged Network
 - ii. Structured Cabling
 - iii. FCAPS
- b) A systems auditor has concluded a network is poorly design. Identify and explain any two possible observations that may have made her to draw the conclusion **(4 Marks)**
- c) While gathering information about the operations of DKUT Network with a view of expanding and improving its performance, it was recommended that Ethernet will be the technology, UTP the cabled media in conjunction with wireless IEEE 802.11g/n while each department will logically be subdivided from the main network
- i) Identify the name given to the logical subdivision of a network **(1 Mark)**
 - ii) Using an example, demonstrate addressing impact of implementing 'i' in above **(3 Marks)**
- d) After pulling the horizontal cable from RCL1 to ADMAT wiring closet, it has been realized that the recommended maximum distance for UTP cable has been exceeded. Explain the consequence and recommend a solutions to this problem **(4 Marks)**
- e) DKUT policy on staff laptops demands that each member of staff access the ERP from a device approved by ICT. It has been realized that the logical addressing strategy being used to enforce the policy is inadequate. The management has decided to incorporate physical addressing. Explain the difference between logical and physical addressing and give an example in each case **(4 Marks)**
- f) After buying a new laptop, you have been told that TCP/IP has been configured. You want to test the loop back connection to confirm if this is true. Explain how this test can be done **(2 Marks)**
- g) Briefly explain the difference between bandwidth and throughput and state their unit of measurement **(3 Marks)**
- h) State the role of each of the three elements of SNMP architecture **(3 Marks)**

QUESTION TWO (15 MARKS)

- a) A network interface card has features that can influence decisions of network design because they are hard coded/fixed. Identify and describe any two of these features and their role in a network **(4 Marks)**
- b) As network designer in a new organization, you have been encountering problems with your network mainly due to congestion being caused by collisions and retransmission. You have been advised to segment your network. What will this involve? **(4 Marks)**
- c) Describe the process of terminating a straight through cable **(7 Marks)**

QUESTION THREE (15 MARKS)

- a) State the name and the role of any three tools that may be found in a network technician toolkit. **(3 Marks)**
- b) Identify the cable used for the following tasks **(2 Marks)**
- i. Connecting Switch to Switch
 - ii. Connecting PC to Router for configuration
- c) The following information has been extracted from Science Park network user guide
Nano Technology Sub-network devices IP range-192.168.2.241-192.168.2.246
- i. Convert the last octets in above into binary number **(4 Marks)**
 - ii. What are the number of bits being used for the hosts in the subnet **(2 Marks)**
 - iii. Determine the subnet mask(show working) **(2 Marks)**
 - iv. What is the broadcast address in above subnet(explain) **(2 Marks)**

QUESTION FOUR (15 MARKS)

- a) Describe network interoperability problem **(1 Mark)**
- b) Discuss OSI reference model layer1,layer2 and layer3 in the context of network design **(6 Marks)**
- c) From the command Prompt(MS-DOS) of a network PC, show how you would accomplish the following **(8 Marks)**
- i) Determine MAC address of a computer
 - ii) Determine the IP address of a computer
 - iii) Test connectivity between any two devices
 - iv) Establish the path data has taken from source to destination