

PAN AFRICA CHRISTIAN UNIVERSITY
EXAMINATIONS PAPER



PAN AFRICA CHRISTIAN UNIVERSITY
BACHELORS OF INFORMATION COMMUNICATION TECHNOLOGY
END OF TERM EXAMINATION

DEPARTMENT: COMPUTING & INFORMATION TECHNOLOGY

COURSE CODE: BSIT212

CAMPUS: ROYSAMBU

COURSE TITLE: NETWORK DESIGN AND ADMINISTRATION

EXAM DATE: **FRIDAYxxxxxx/AUGUST**

TIME: **START HOUR: 8.00AM-11.00AM**

INSTRUCTIONS

- This exam carry a total of SIX Questions of [10 Marks Each]
- Section One (I) is compulsory.
- Answer any 3(Three) Questions from Section Two (II)
- Read all questions carefully before attempting.

SECTION A

(Answer ALL questions in this section)

QUESTION ONE (10 Marks)

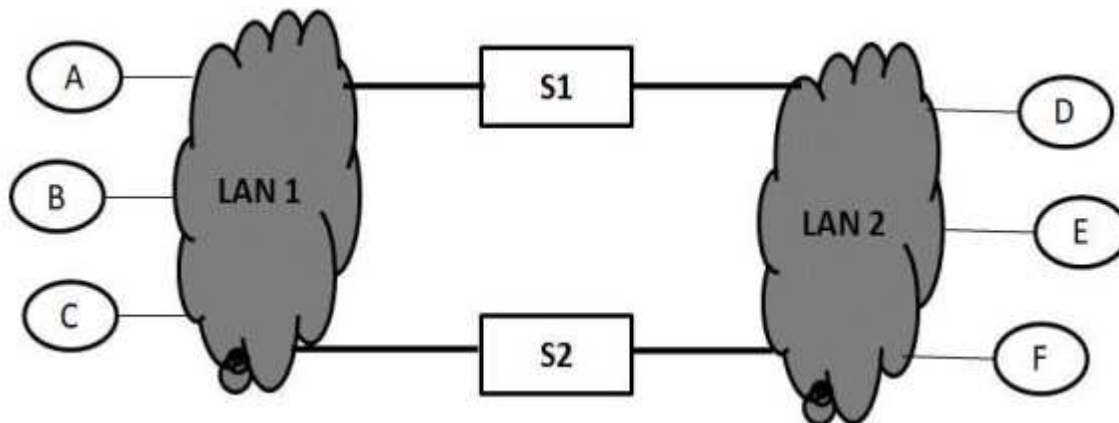
- a) Explain the 4 skills expected of a network designer. **(2 Marks)**
- b) Discuss the encapsulation information within four protocol data units given the data forwarding scenario. **(2 Marks)**
- c) Distinguish between a trunk port versus an access port **(2 marks)**
- d) Using a chart diagram and a borrowing table illustrate the possible network sizes of a network whose network ID is 192.168.0.0/24+ **(4 Marks)**

QUESTION TWO (10 Marks)

- a) Discuss two network design best practices. **(2 marks)**
- b) Describe how sub-netting improves Network security. **(4 marks)**
- c) Among the services offered by the Network management system is measuring the Network Quality of Service (QoS). AS a network manager, describe two parameters to consider when determining the Network quality of service. **(4 marks)**

QUESTION THREE (10 Marks)

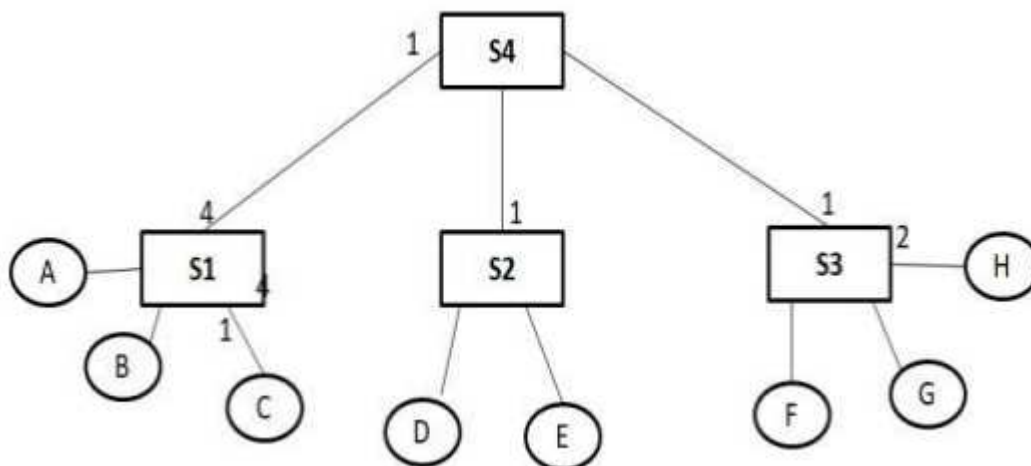
- a) An already implemented network was designed on two LANs connected by two switches as shown below.



- (i) Host B on LAN 1 sends a frame F with an unknown destination. Analyze the transmission of the frame across the two LANs given that LAN 2 receives and sends a feedback to LAN1. **(7marks)**
- (ii) With reference to your analysis in (i) above, deduce whether the network design is good or bad. IF bad, recommend how it could be improved/rectified. **(3marks)**

QUESTION FOUR (10 Marks)

Self-learning multi-switch Ethernet network is designed as shown below. The self-learning switches are labeled S1, S2, S3 AND S4 and the network hosts are labeled with letters A through H. The various connection device parts are numbered with Arabic numerals.



Suppose host C sends a frame to node H and node H responds to the sender host C. Assuming that the switch tables of ALL the switches are initially empty. Construct the switch table entries for each switch. **(10marks)**

QUESTION FIVE (10 Marks)

An international organization is granted a block of address starting with 190.100.0.0/16 (65,336 addresses). The organization needs to distribute these addresses to three groups to be assigned to their three regional headquarters (Western, central and Western) as stated below:

- The central region headquarters house 64 branches and each needs 256. Addresses.
- The Easter region headquarters has 128 branches and each needs 128 addresses.
- The Western headquarters has 128 branches and each needs 64 addresses.

For this design find out how many addresses will still be available after these allocations is done. **(10 marks)**

QUESTION SIX(10 Marks)

- a) Highlight four network design best practices. **(4 Marks)**
- b) As a network designer, you are required to provide a rationale to an organizations' managers for a design to replace the organization's flat network topology with a hierarchical network topology. Describe THREE features of the hierarchical network design to convince the management that it is a better design choice. **(6marks)**

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