



**NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY**

Faculty of Computing and Informatics

Department of Computer Science

QUALIFICATION: BACHELOR OF COMPUTER SCIENCE IN CYBER SECURITY BACHELOR OF COMPUTER SCIENCE	
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COURSE: COMMUNICATION NETWORKS	COURSE CODE: CMN620S
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DURATION: 2 HOURS 30 MINUTES	MARKS: 70

FIRST OPPORTUNITY EXAMINATION QUESTION PAPER	
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THIS QUESTION PAPER CONSISTS OF 5 PAGES
(Excluding this front page)

INSTRUCTIONS

1. Answer ALL the questions.
2. Write clearly and neatly.
3. Number the answers clearly.
4. When answering questions you should be guided by the allocation of marks. Do not give too few or too many facts in your answers.

PERMISSIBLE MATERIALS

1. Non-programmable calculator.

Question 1

Indicate whether the following statements are true or false. [6]

- 1.1 In a cable access network, the responsibility of a Cable Modem Termination System (CMTS) is to translate/convert analog signals sent from the cable modems in many downstream houses/residents back into digital format.
- 1.2 The purpose of a DSLAM in a DSL access network is to convert between analog and digital data.
- 1.3 In circuit switching, there is no sharing of resources.
- 1.4 Within an AS, all routers run the same intra-AS routing protocol.
- 1.5 Secure Sockets Layer (SSL) can be applied to UDP to enhance security.
- 1.6 An IP address 172.32.0.1 can be issued to a LAN because it is a private IP address.

Question 2

Choose the correct answer from the multiple choice questions below: [6]

- 2.1 Which of the following is correct regarding class C address of IP address?
 - a) Network bits = 22; Host bits = 10
 - b) Network bits = 26; Host bits = 6
 - c) Network bits = 24; Host bits = 10
 - d) Network bits = 20; Host bits = 12
- 2.2 How many usable host IP addresses are available on the 192.168.10.128 /26 network?
 - a) 30
 - b) 32
 - c) 62
 - d) 64
- 2.3 What layer will you use to generate the data if you use either Telnet or FTP?
 - a) Application
 - b) Transport
 - c) Network
 - d) Presentation

- 2.4 Assuming the default switch configuration, which VLAN range can be added, modified, and removed on a Cisco switch?
- a) 1 through 1002
 - b) 2 through 1001
 - c) 1 through 1001
 - d) 2 through 1002
- 2.5 Open Shortest Path first (OSPF) disseminates information in the form of ____.
- a) anycast
 - b) unicast
 - c) multicast
 - d) broadcast
- 2.6 A type of routing protocol that exchanges entire routing tables at regular intervals is ...
- a) Link-state
 - b) Interior Gateway Protocol
 - c) Distance vector
 - d) All of the above

Question 3

Define the following concepts/key words used in communication networks.

- 3.1 Socket [2]
- 3.2 Boundary router [2]

Question 4

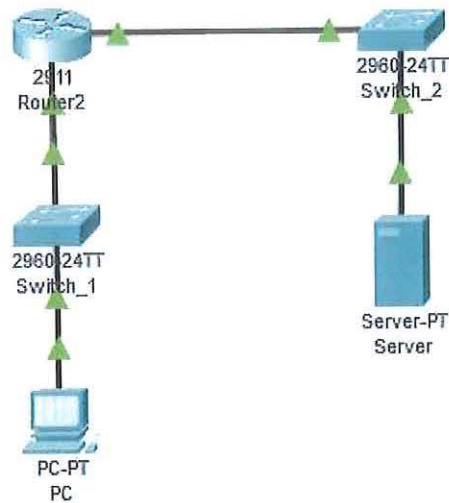
- 4.1 Differentiate between contiguous and discontinuous network. [2]
- 4.2 Discontinuous subnets have several advantages over contiguous subnets. (Yes or No?) [1]

Question 5

- 5.1 Explain why a layer 2 cisco switch is regarded as a self-learning device. [2]
- 5.2 Explain the concept of flooding that is used by link-layer switches. [2]

Question 6

- 6.1 With a focus on addressing at layer 2 and 3, what destination addresses will be used by the PC to send data to the server as shown in the figure? Assume that the PC does not know the server's IP address but knows the address of the first hop count. [2]



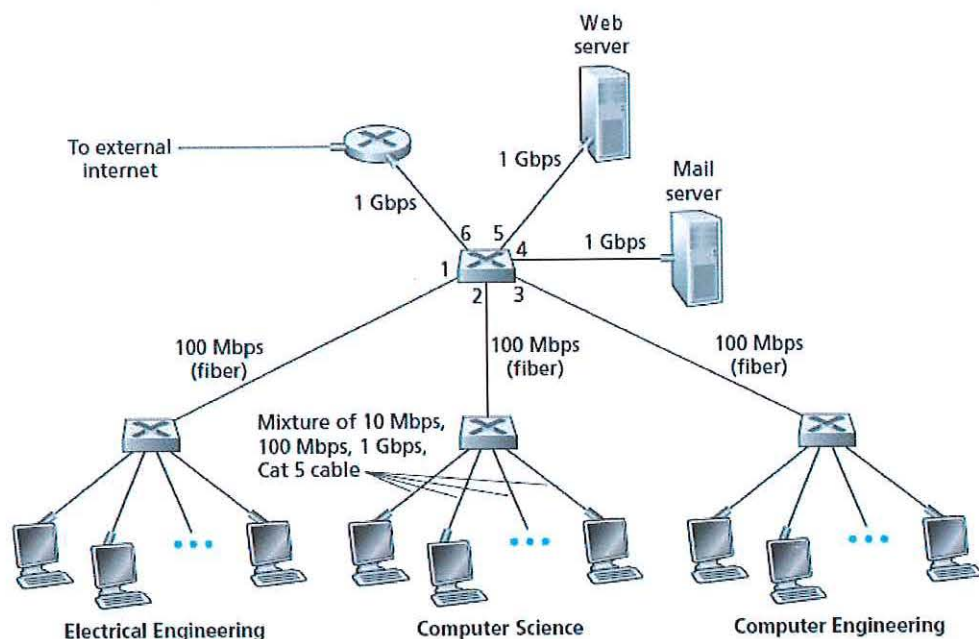
- 6.2 Briefly describe the purpose of IEEE 802.1Q encapsulation protocol. [2]
- 6.3 What is the difference between an access port and a trunk port? [2]

Question 7

- 7.1 ISPs are responsible for assigning companies/organisations with IP address networks/blocks. Where does the ISPs get these IP address networks/blocks from? [2]
- 7.2 Name any two Regional Internet Registers (RIRs) that allocates addresses to their respective regions. [2]

Question 8

Consider the following figure that illustrates an institutional network connected by four switches.

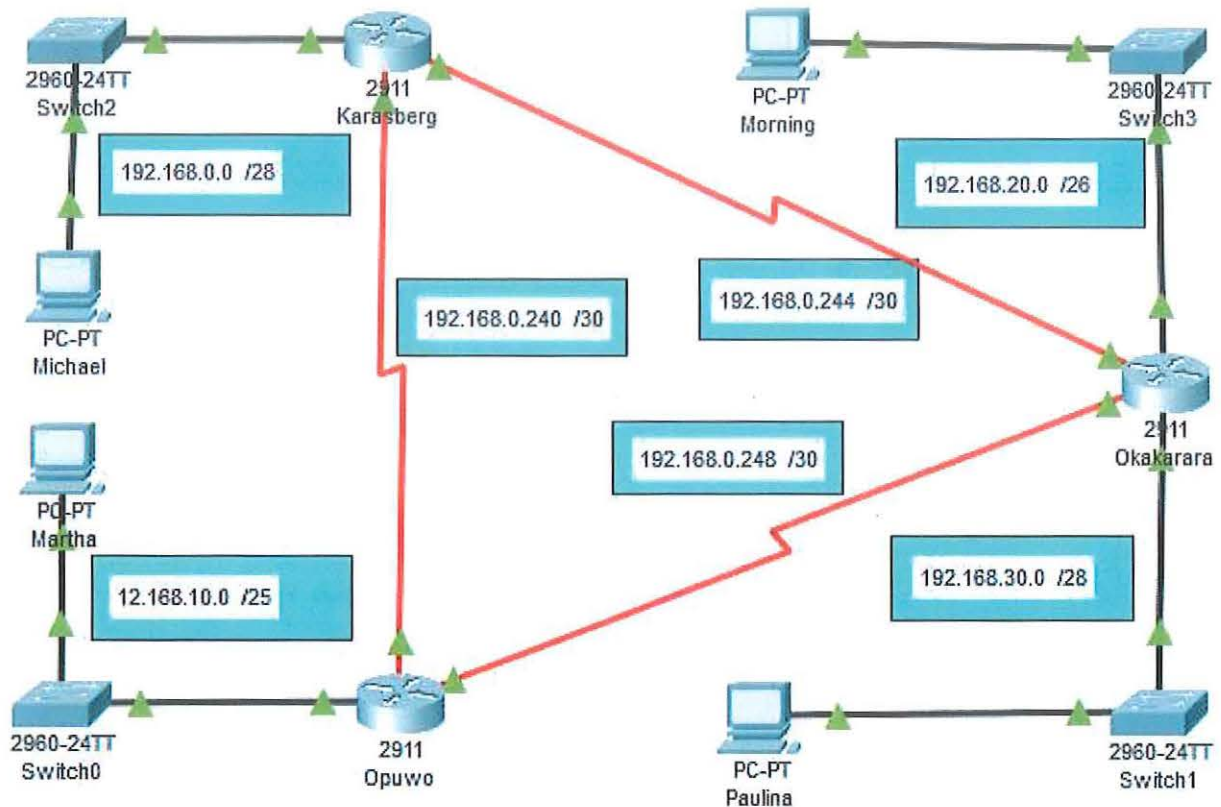


Explain three drawbacks that can be identified in the figure above.

[6]

Question 9

Consider the topology below and answer the questions that will follow:



- 9.1 What type of unencrypted router password need to be configured if a user want to access the privileged EXEC mode of Okakarara router? [1]
- 9.2 A suggested IP address for Morning PC is the last usable IP address within the range. Write down this IP add address. [2]
- 9.3 A suggested IP address for Martha PC is 192.168.10.130. Is this an accepted IP address? (Yes or No). [1]
- 9.4 What default gateway will be configured on Michael PC? [2]
- 9.5 A network administrator decides to configure Opuwo router with RIP routing protocol. Assist her by writing down the networks that she needs to configure. [3]
- 9.6 What is the purpose of configuring a routing protocol? [2]

Question 10

You are the Network Administrator of a company in Windhoek. The company has just established new branches in three suburbs. Utilising VLSM, calculate subnets that will meet the needs of the company. Consider the class B IP address block: 172.18.0.0 /18

- Pioneerspark – 3000 users
- Havana – 500 users
- Otjomuise – 60 users
- Eros – 8 users

You are required to re-draw the table below and then fill it in with the necessary information as per your subnetting. [20]

Network Name	Network Address	Usable host range	Broadcast Address	Subnet Mask
Pioneerspark				
Havana				
Otjomuise				
Eros				

Marks distribution: [1.5 marks for each network address]

[1.5 marks for each host range]

[1 mark for each broadcast address]

[1 mark for each subnet mask]

Total = 20 marks

End of Paper