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 COMPTER SCIENCE	
QUALIFICATION CODE: 07BCCS; 07BACS	LEVEL: 7
COURSE: COMMUNICATION NETWORKS	COURSE CODE: CMN620S
DATE: JANUARY 2023	SESSION: 2
DURATION: 2 HOURS 30 MINUTES	MARKS: 70

SECOND OPPORTUNITY / SUPPLEMENTARY EXAMINATION QUESTION PAPER	
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THIS QUESTION PAPER CONSISTS OF 4 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.   [4]

1.1   An ARP package has fields containing link-layer addresses as well as network-layer addresses.

1.2   Routers operate at network layer by utilising datagrams, while switches operate at link layer by utilising frames.

1.3   Routers operate at network layer by utilising frames, while switches operate at link layer by utilising datagrams.

1.4   If a computer has two network cards, it also means that it must have two layer-2 addresses.

Question 2

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

2.1   What is the broadcast address of 200.70.55.1 /18?

   a)   200.70.15.255
   b)   200.70.63.255
   c)   200.70.68.255
   d)   200.70.31.255

2.2   Open Shortest Path first (OSPF) disseminates information in the form of _____.

   a)   unicast
   b)   multicast
   c)   broadcast
   d)   anycast

2.3   Which class of IP Addresses has the least host addresses available by default?

   a)   A
   b)   B
   c)   C
   d)   A and B

2.4   On a VLSM network, which mask should you use on point-to –point WAN links in order to reduce the wastage of IPA addresses?

   a)   /28
   b)   /29
   c)   /30
   d)   /31

2.5   Link state routing protocols exchange the following information with one another. (Choose two).

   a)   Link state for every link

   d)   A link and a state for every destination

   c)   Hello packets with every link

   d)   Hello packets with every neighbour

   e)   Link state for every state

Question 3

3.1   List three major components of electronic mail.   [3]

3.2   Which mail access protocol allow users to organize messages in folders and keeps user state across sessions?   [1]

Question 4

Assume packets are being transmitted from a host source to a host destination through some routers.

4.1   Explain how does loss and delay of such packets can occur.   [2]

4.2   Explain how a router can overcome this loss and delay.   [2]

Question 5

5.1   OSPF was conceived as the successor to RIP. As such, it has a number of advanced features. Explain any three such advances of OSPF.   [3]

5.2   Define RIP as a routing protocols with respect to which mechanism do routers running this protocol obtain knowledge about their neighbours?   [2]

Question 6

6.1   What are the three contents of an ARP table?   [3]

6.2   In a switched network, host A wants to communicate to host B on the same LAN.
        Host A does not have host B's MAC address in its ARP table. Explain how host A can
        still manage to communicate to host B.   [3]

6.3   Explain the concept of flooding that is used by link-layer switches.   [2]

Question 7

7.1   In a form of a table as below, differentiate between TCP and UPD.   [6]

TCP	UDP
•	•
•	•
•	•

7.2   Explain how TCP can be enhanced in terms of security services.   [2]

7.3   Give two example of a protocol/application that utilises UDP.   [2]

Question 8

Consider the topology below and answer the questions that will follow.
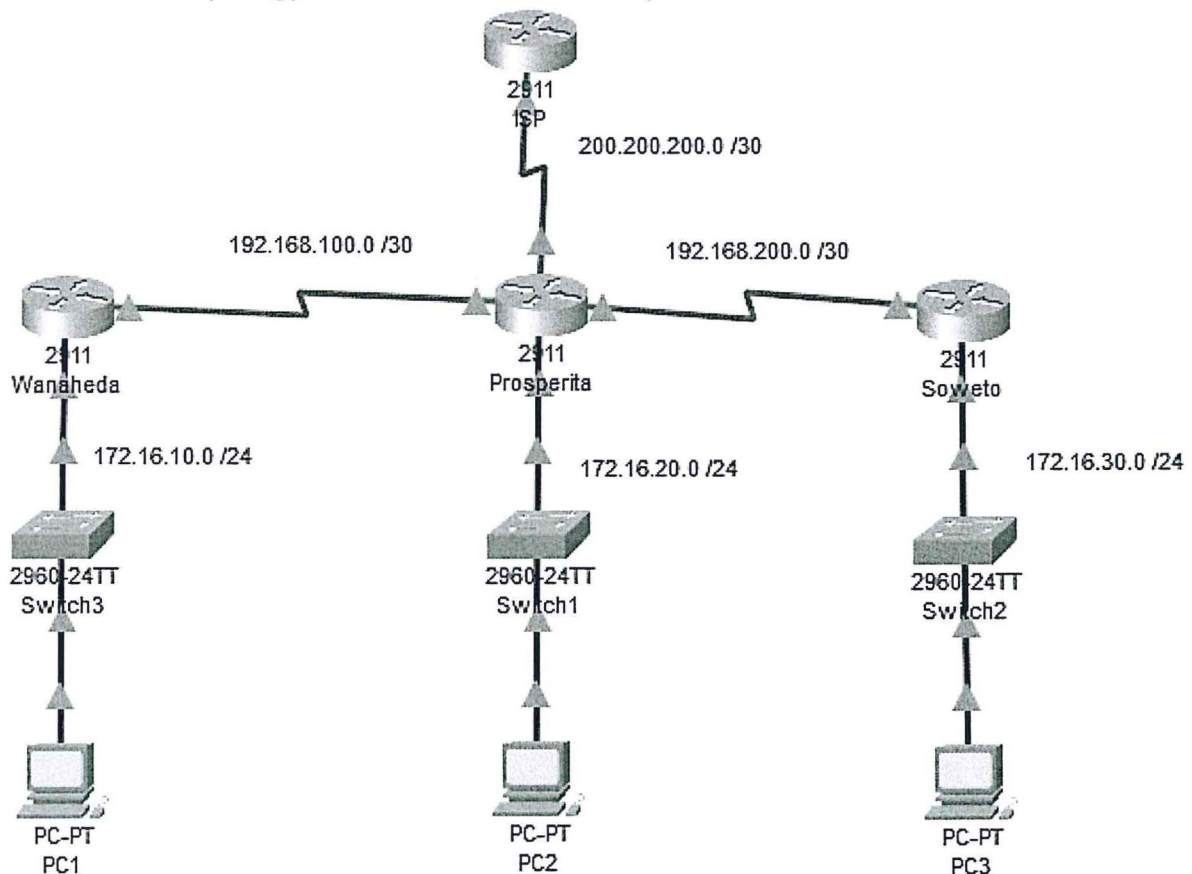
8.1 After configuring the above topology with a routing protocol, state any of the networks that will be learned by the Prosperita router. (Mention two). [2]

8.2 Suggest a possible default gateway address for PC_2. [1]

8.3 The suggested IP address for PC_3 is the last usable IP address for the subnet. Write down this IP address. [2]

8.3 State the IP addresses of the interfaces for the serial connection 192.168.100.0 /30. [2]

Question 9

Given the IP Addresses below, provide the network number and the broadcast address.

9.1 172.18.120.120 /16

Network number: [2]

Broadcast Address: [1]

9.2 192.168.150.70 /26

Network number: [2]

Broadcast Address: [1]

Question 10

As a Network Administrator of a company, you are given a class B IP address block: 172.27.0.0 /18

Utulising CIDR, calculate the subnets that will be assigned to each department of the company. You are informed that each department requires 500 users:

As per your subnetting, clearly indicate:

10.1 Number of subnets that will be created. [2]

10.2 Number of usable hosts per subnet. [2]

10.3 List the first three subnets. [6 (2 for each)]

10.4 State the usable host range for each subnet mentioned in 10.3. [6 (2 for each)]

End of exam