



**NAMIBIA UNIVERSITY  
OF SCIENCE AND TECHNOLOGY**

**Faculty of Computing and Informatics**

**Department of Computer Science**

<b>QUALIFICATION:</b> Bachelor of Computer Science in Cyber Security Bachelor of Computer Science	
<b>QUALIFICATION CODE:</b> 07BCCS; 07BACS	<b>LEVEL:</b> 7
<b>COURSE:</b> Internet and WAN Telecommunications	<b>COURSE CODE:</b> IWT711S
<b>DATE:</b> June 2023	<b>SESSION:</b> 1
<b>DURATION:</b> 2 hours	<b>MARKS:</b> 70

<b>FIRST OPPORTUNITY EXAMINATION QUESTION PAPER</b>	
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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. None

## Section A [15 marks]

### Question 1

For the following questions, answer True/False.

[7]

- 1.1 Outside Global – the actual address assigned to an outside host (public address).
- 1.2 DHCP only supports Automatic allocation and Dynamic allocation for IP address allocation.
- 1.3 The IPv6 address 2001:0030:0001:ACAD:0000:330E:10C2:32BF can also be abbreviated as 2001:30:1:ACAD::330E:10C2:32BF
- 1.4 Hertz (Hz) is the measure of the relative strengths of two signals or a signal at two different points.
- 1.5 The range of private IP addresses for class A starts from 10.0.0.0 to 10.10.255.255.
- 1.6 The router that is closer to the source router is called an upstream router in MPLS network.
- 1.7 Radio waves are converted to an electrical signal to produce sound.

### Question 2

Choose the correct answer from the multiple choice questions below.

[8]

- 2.1 Which VPN technology implements confidentiality?
  - a) ESP
  - b) MD5
  - c) ISAKMP
  - d) AES
  
- 2.2 If the client knows that it no longer needs an IP address, which DHCP packet type will be sent to a DHCP server?
  - a) DHCP renew
  - b) DHCP decline
  - c) DHCP release
  - d) DHCP NAK

- 2.3 Which of the following is not true regarding IPv6?
- a) The header includes the flow label field
  - b) The address is of 32 bits
  - c) Contains both the source and destination address fields.
  - d) supports both audio and video
- 2.4 Terrestrial microwave communication can use \_\_\_\_\_ for transmission.
- a) repeaters
  - b) parabolic dish antenna
  - c) aperture antenna
  - d) all of the above
- 2.5 The purpose of \_\_\_\_\_ is to compensate for an attenuated signal loss.
- a) an antenna
  - b) an amplifier
  - c) a transmitter
  - d) an LED
- 2.6 Which of the following technologies provides permanent virtual circuits?
- a) Frame relay
  - b) PSTN
  - c) ADSL
  - d) ISDN
- 2.7 What is the size of an MPLS label?
- a) 200 bytes
  - b) 100 bytes
  - c) 40 bytes
  - d) 4 bytes
- 2.8 Which of the following is a digital multiplexing method?
- a) Synchronous TDM
  - b) Asynchronous TDM
  - c) WDM
  - d) Both a) and b)

**Section B [55 marks]**

**Question 3**

Define the following concepts as used in communication networks.

- 3.1 Delay distortion [2]
- 3.2 Circuit switching [2]

**Question 4**

As a Network Administrator, you can either make use of a twisted pair, coaxial or fiber optic cables as a means of data transmission medium.

- 4.1 Describe the physical construction characteristics of twisted pair cables in comparison to coaxial cables. [4]
- 4.2 In terms of distance and data rate, differentiate between twisted pair and fiber optic cables. [4]

**Question 5**

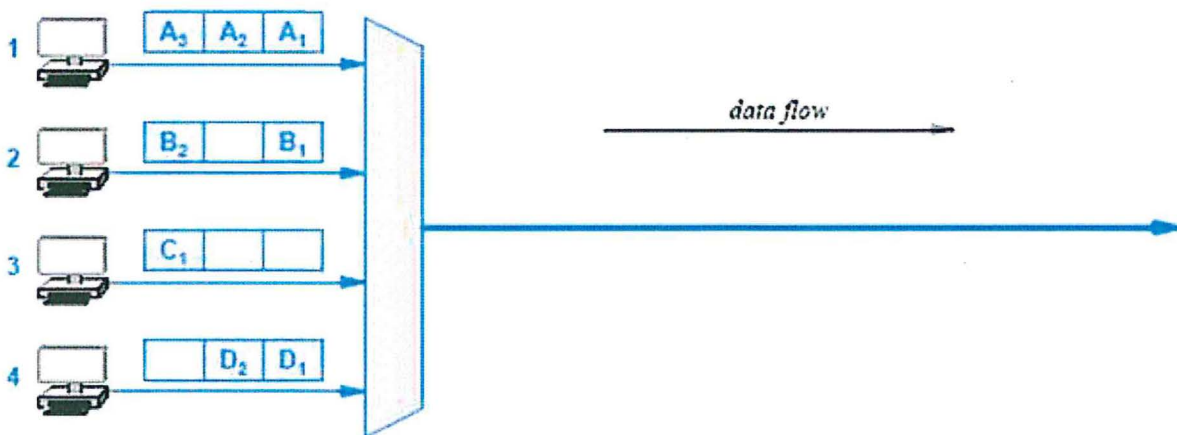
Explain the fundamental differences between how analog and digital signals are propagated. [4]

**Question 6**

- 6.1 Explain the term MPLS. [2]
- 6.2 Mention the two protocols used by the control plane to exchange labels in MPLS. [1]

**Question 7**

Consider the figure below and answer the questions that follow:



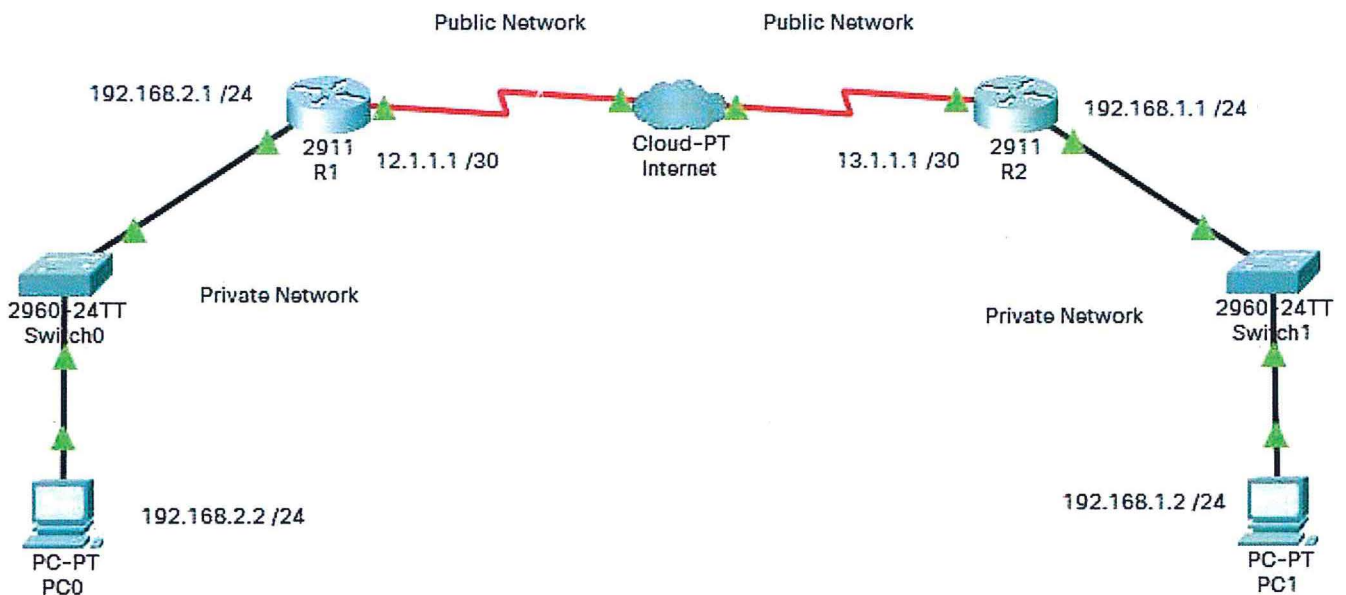
- 7.1 Construct the data flow that will be produced from the four devices using synchronous TDM. [4]
- 7.2 Construct the data flow that will be produced from the four devices using asynchronous (statistical) TDM. [4]
- 7.3 Explain how Code Division Multiplexing (CDM) works? [2]

**Question 8**

- 8.1 With the aid of the diagram, explain how the communication and assignment of IP Addresses between a DHCP client and DHCP server is facilitated. [9]
- 8.2 Mention any three drawbacks of utilizing DHCP services on a network. [3]

**Question 9**

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



9.1 From the above network topology, indicate which device interface (IP address) belong to:

- a) Inside local: \_\_\_\_\_ [1]
- b) Inside global \_\_\_\_\_ [1]
- c) Outside local \_\_\_\_\_ [1]
- d) Outside global \_\_\_\_\_ [1]

9.2 Explain three purposes of configuring Network Address Translation (NAT) on a network. [3]

**Question 10**

There is a maximum data transmission distance limit when using UPT cables.

10.1 What is the maximum distance limit for CAT 5? [1]

10.2 What is the maximum distance limit for CAT 6? [1]

10.3 What is the difference between multi-mode and single-mode fiber-optic cable? [2]

10.4 Which type twisted pair cable will you use to connect:

a) Switch to switch: [1]

b) PC to router: [1]

b) PC to switch: [1]

**End of question paper**