



**PAMIBIA 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 2024	<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 In WANs, modems are used to convert digital data to analog data and vice versa.
- 1.2 Inside global – is the actual address assigned to an inside host (private address).
- 1.3 The IPv6 address space is  $128^2$
- 1.4 WDM is very similar in concept to FDM.
- 1.5 In wireless transmission media, an antenna used at the transmitter side is different from the antenna used at the receiver side.
- 1.6 A digital transceiver is used to convert digital data to digital analog and vice-versa.
- 1.7 MPLS does not provide an efficient mechanism for supporting VPNs.

### Question 2

Choose the correct answer from the multiple choice questions below.

[8]

- 2.1 In TDM, slots are further divided into \_\_\_\_\_.
  - a) seconds
  - b) frames
  - c) packets
  - d) bits
- 2.2 From the following types of addresses, which one is allowed in IPv6?
  - a) Unicast
  - b) Anycast
  - c) Multicast
  - d) All of the above
- 2.3 \_\_\_\_\_ has an inner conductor and an outer conductor separated by insulation.
  - a) twisted-pair cable
  - b) fiber-optic cable
  - c) coaxial cable
  - d) all of the above

- 2.4 The DLCI field in Frame Relay can define up to \_\_\_\_\_ DLCIs.
- a) 128
  - b) 512
  - c) 256
  - d) 1024
- 2.5 In the \_\_\_\_\_ transmission mode, both stations can transmit and receive at the same time.
- a) full-duplex
  - b) half-duplex
  - c) Simplex
  - d) b and c
- 2.6 What is the main problem in multiplexing packets of different sizes?
- a) Smaller packets are always transmitted first.
  - b) Larger packets are always transmitted first.
  - c) Smaller packets may experience delayed transmission.
  - d) Packets are transmitted according to size.
- 2.7 When a signal changes its form or shape, this type of transmission impairment is called \_\_\_\_\_.
- a) attenuation
  - b) distortion
  - c) noise
  - d) all of the above
- 2.8 In MPLS Network, at the first Edge LSR, label is added to the packet. This process is called ...
- a) pop
  - b) push
  - c) swap
  - d) hph

## Section B [55 marks]

### Question 3

Explain the following concepts as used in Internet and WAN Telecommunications:

- 3.1 Full-duplex [2]
- 3.2 Noise [2]

### Question 4

Differentiate between a digital signal and an analog signal. [4]

### Question 5

- 5.1 Why must a satellite have distinct uplink and downlink frequencies? [2]
- 5.2 Outline two factors determine antenna gain? [2]
- 5.3 What is the primary cause of signal loss in satellite communications? [2]

### Question 6

- 6.1 VPNs are required to provide secure lines of communications by implementing some security measures. Mention and explain any three such measures. [6]
- 6.2 Explain two disadvantages of utilising a VPN in a network. [2]
- 6.3 IPsec is often used to set up VPNs. IPsec is a group of protocols that are used together to set up encrypted connections between devices. It helps keep data sent over public networks secure. Mention two primary security protocols that are used by IPsec. [2]

### Question 7

Name and explain three causes of transmission impairments. [6]

**Question 8**

Match the following IPv6 addresses to their corresponding types.

[4]

IPv6 Address	Type
::1	Unicast
FE80::C001:1DFF:FEE0:0	Multicast
3001:0060:0000:0000:0000:0CB4: 1E24:981A/64	Loopback
FF02::2	Link Local

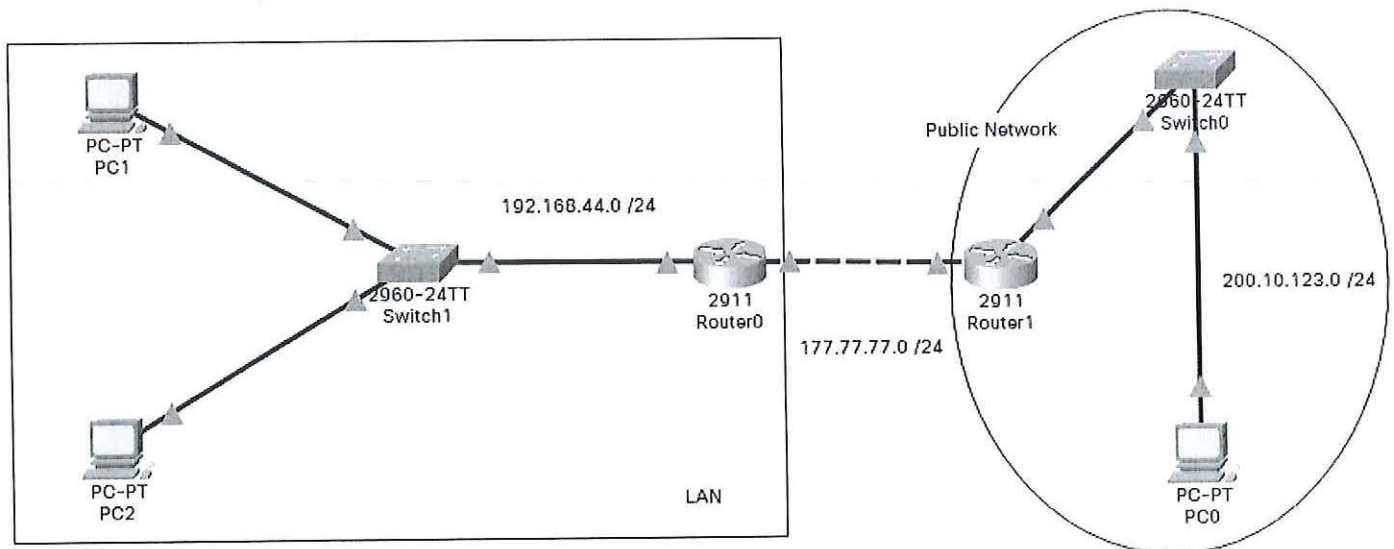
**Question 9**

9.1 Differentiate between synchronous and asynchronous Time Division Multiplexing (TDM). [4]

9.2 Differentiate between Frequency Division Multiplexing (FDM) and Wavelength Division Multiplexing (WDM). [4]

**Question 10**

Consider the figure below and answer the questions that follow:



10.1 Configure a static default route on both routers so that the routers can direct traffic to their destinations respectively. [4]

10.2 On Router0, configure a standard access list using an access list of id 10 and permit any device on the subnet 192.168.44.0 /24. [3]

10.3 On Router0, create a dynamic IP Address pool that will hold a list of inside global addresses. Consider the table below to aid you. [4]

Pool Name	Starting IP Address	Ending IP Address	Network Mask
IWT_TEST	192.168.44.1	192.168.44.14	/ 20

10.4 Now you need to verify if there are any IP translations that are made. What is the command that is used to verify this? [2]

Command: \_\_\_\_\_

**End of Paper**