



**PAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY**

Faculty of Computing and Informatics

Department of Computer Science

QUALIFICATION: Bachelor of Computer Science in Cyber Security	
QUALIFICATION CODE: 07BCCS	LEVEL: 7
COURSE: Internet and WAN Telecommunications	COURSE CODE: IWT711S
DATE: July 2025	SESSION: 2
DURATION: 2 hours	MARKS: 70

SECOND OPPORTUNITY / SUPPLEMENTARY 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. None

Section A [12 marks]

Question 1

For the following questions, answer True/False.

[6]

- 1.1 Inside global – the actual address assigned to an inside host (private address).
- 1.2 192.192.0.1 is an example of a public IP Address.
- 1.3 TTL propagation can be disabled to hide the MPLS network topology.
- 1.4 With unguided media, the antenna is considered more important in terms of the bandwidth produced.
- 1.5 Radio waves are converted to an electrical signal to produce sound.
- 1.6 Outside Local NAT address is an IP address used to translate an outside private IP address.

Question 2

Choose the correct answer from the multiple-choice questions below.

[6]

- 2.1 In the transmission of terrestrial microwaves ____ can regenerate the signal at each antenna.
 - a) repeaters
 - b) bridges
 - c) routers
 - d) any of the above

- 2.2 Which two DHCP packet types contain an IP address to be leased to a client?
 - a) Offer and Release
 - b) Offer and NAK
 - c) Offer and Acknowledgement
 - d) Offer and Renew

2.3 _____ is an analog multiplexing technique usually involving signals in the visible light frequencies.

- a) FDM
- b) TDM
- c) WDM
- d) MDM

2.4 In TDM, slots are further divided into _____.

- a) seconds
- b) bits
- c) packets
- d) frames

2.5 In the _____ transmission mode, each station can transmit, but not at the same time.

- a) simplex
- b) half-duplex
- c) full-duplex
- d) both b) and c)

2.6 Which of the following is usually not classified as a guided medium?

- a) Twisted-pair cable
- b) Coaxial cable
- c) Fiber-optic cable
- d) None of the above

Section B [58 marks]

Question 3

Explain the following concepts as used in internet and WAN telecommunications:

- 3.1 Half-duplex [2]
3.2 Crosstalk [2]

Question 4

- 4.1 The maximum rate at which data can be transmitted over a given communication path, or channel, under given conditions, is referred to as the channel capacity. Mention four factors that affect channel capacity. [4]
4.2 What are the three causes of signal degradation and bit errors between signal received and signal transmitted? [3]

Question 5

- 5.1 Explain why you would prefer to utilise ADSL rather than cable modem for internet connectivity? [3]
5.2 What type of multiplexing method does ADSL utilise? [1]
5.3 What is the distance range does ADSL scheme provide? [1]

Question 6

- 6.1 Explain how Stateless Address Autoconfiguration works in IPv6. [3]
6.2 IPv4 uses Address Resolution Protocol (ARP). What IPv6 protocol replaces ARP? [2]

Question 7

Consider the figure below regarding VPN configuration and answer the questions that follows:

```
Line 1 R1(config)# crypto isakmp policy 10  
Line 2 R1(config-isakmp)# encryption aes  
Line 3 R1(config-isakmp)# authentication pre-share  
Line 4 R1(config-isakmp)# group 2  
Line 5 R1(config-isakmp)# exit  
Line 6 R1(config)# crypto isakmp key cisco address 10.2.2.2
```

- 7.1 What is the purpose the configuration in line 2? [1]
- 7.2 What is the purpose the configuration in line 4? [2]
- 7.3 What is the purpose the configuration in line 6? [2]
- 7.4 Explain two advantages and two disadvantages of utilising a VPN in a network. [4]
- 7.5 What is tunneling in VPN? [2]

Question 8

- 8.1 Explain four benefits of utilising frame relay. [4]
- 8.2 What are DLCIs as used in Frame Relay? [2]
- 8.3 Distinguish between Permanent Virtual Circuits (PVCs) and Switched Virtual Circuits (SVCs). [2]

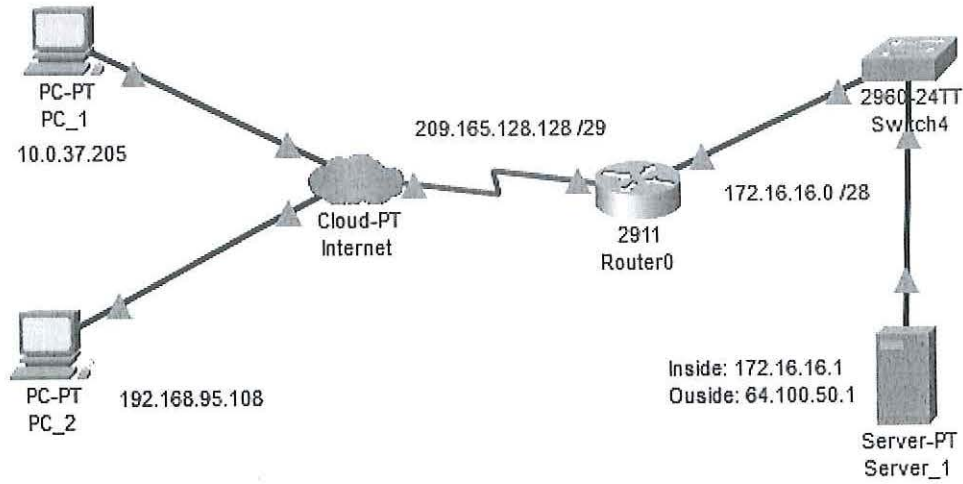
Question 9

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.

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

Question 10

Consider the figure below and answer the questions that follow:



- 10.1 Write down the full command that will create a static NAT translation to map the Server_1 inside address to its outside address. [3]
- 10.2 Mention any other method that can be used to configure NAT. [1]
- 10.3 Write down the commands that will configure the correct inside and outside interfaces on the router. Write separate commands for each of the two interfaces. [4]
- 10.4 Write down the command that you can issue on the router to verify the static NAT configurations. [2]

End of Paper