



**NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY**

Faculty of Computing and Informatics

Department of Computer Science

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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 [15 marks]

Question 1

For the following questions, answer True/False.

[7]

- 1.1 IPv6 have fewer header fields compared to IPv4.
- 1.2 Radio waves are converted to an electrical signal to produce sound.
- 1.3 In Analog WANs, a telephone is used to convert digital data to analog and vice versa.
- 1.4 172.16.32.0.1 is an example of a public IP Address.
- 1.5 TDM is an analog multiplexing technique usually involving signals in the visible light frequencies.
- 1.6 The IPv6 address 2001:0030:0001:ACAD:0000:330E:10C2:32BF can also be abbreviated as 2001:30:1:ACAD::330E:10C2:32BF.
- 1.7 TTL propagation can be disabled to hide the MPLS network topology.

Question 2

Choose the correct answer from the multiple choice questions below.

[8]

- 2.1 Which of the following is a digital multiplexing method?
 - a) FDM
 - b) Asynchronous TDM
 - c) Synchronous TDM
 - d) b and c

- 2.2 Which of the following is not true regarding IPv6?
 - a) The header includes the flow label field
 - b) It has a 128 bit source address and a 128 bit destination address
 - c) The header includes a "header checksum"
 - d) It makes use of Hop Limit instead of Time To Live

- 2.3 The _____ is the maximum value/strength of signal over time.
- a) phase
 - b) peak amplitude
 - c) frequency
 - d) bandwidth
- 2.4 What is the advantage of using a satellite in microwave communication?
- a) The limitations imposed on distance by the earth's curvature is reduced.
 - b) Remote areas can be serviced.
 - c) Leasing time or frequencies is relatively inexpensive.
 - d) All of the above
- 2.5 Which factor makes fiber-optic cable superior to twisted-pair cable?
- a) bandwidth range
 - b) cost
 - c) maintenance
 - d) robustness
- 2.6 UTP is popular in LAN technology due to its _____
- a) flexibility
 - b) low cost
 - c) ease of installation
 - d) all of the above
- 2.7 The _____ of a signal is the time it needs to complete one cycle.
- a) amplitude
 - b) frequency
 - c) period
 - d) phase
- 2.8 ATM can be used for _____.
- a) LAN
 - b) WAN
 - c) Private networks
 - d) Networks covering any range

Section B [55 marks]

Question 3

- 3.1 Why would a network administrator will choose to use an ATM Network? [2]
- 3.2 Name two advantages for an ATM cells. [2]
- 3.3 Mention two approaches that are used in establishing an ATM connection. [2]

Question 4

- 4.1 Describe three characteristics of fiber optic cable. [3]
- 4.2 Name two sources of light used in fiber optic cable [2]

Question 5

- 5.1 Name and explain the three types of VPN. [6]
- 5.2 IPsec is one of the protocols that can be used in VPNs. Explain any two benefits of IPsec. [2]

Question 6

- 6.1 Define multiplexing. [2]
- 6.2 If the analog signals are multiplexed, then it is referred to as analog multiplexing. Similarly, if the digital signals are multiplexed, then it is referred to as digital multiplexing. From the types of multiplexing below, choose whether they are part of analog or digital multiplexing. [4]

Frequency Division Multiplexing _____

Synchronous Time Division Multiplexing _____

Asynchronous Time Division Multiplexing _____

Wavelength Division Multiplexing _____

- 6.3 Name the steps that are used when packets are sent in Frequency Division Multiplexing (FDM) [3]
- 6.4 Explain why guard bands are used in FDM. [2]

Question 7

- 7.1 Explain why an isotropic antenna is regarded as an ideal antenna. [2]
- 7.2 What is meant by antenna again? [2]
- 7.3 Mention three applications that are used in satellite microwaves. [3]
- 7.4 Name the two main transmission impairments in wireless transmissions. [2]

Question 8

- 8.1 Explain how frame relay works. [3]
- 8.2 What is a DLCI as used in frame relay? [2]

Question 9

Consider the figure below that shows IP NAT translations and answer the questions that follow:

```
Pro  Inside global      Inside local          Outside local         Outside global
---  209.165.202.130     192.168.20.254      ---
tcp  209.165.202.129:1024 192.168.30.10:1025 209.165.201.30:80   209.165.201.30:80
tcp  209.165.202.129:1025 192.168.10.10:1025 209.165.201.30:80   209.165.201.30:80
tcp  209.165.202.130:1025 192.168.20.254:1025 209.165.201.30:80   209.165.201.30:80
I
R2#
```

- 9.1 State any two transitions that were made between private and public IP addresses. [2]
- 9.2 What type of action was executed in order for these transitions to take place? [2]

Question 10

Consider figure 1 below and answer the questions that follow.

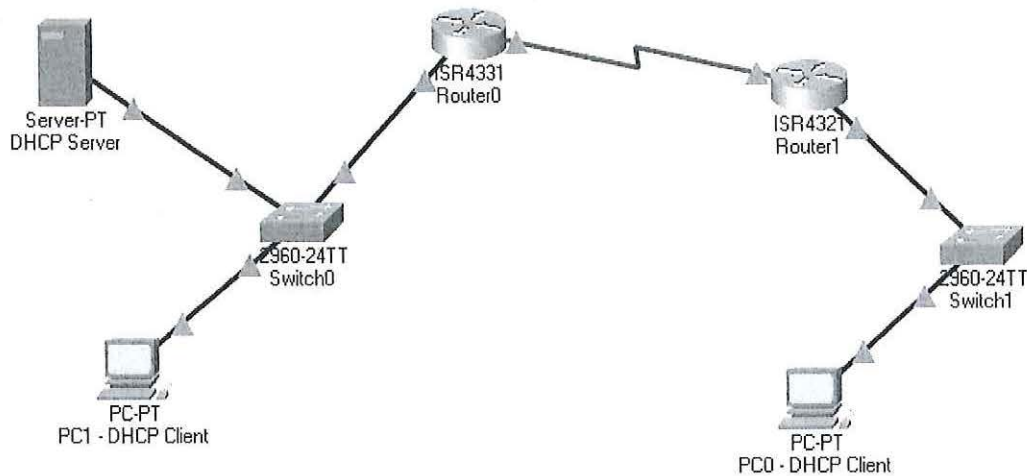


Figure 1

- 10.1 What is the name of the DHCP packet type/message that is sent by a DHCP client to the DHCP server when the client want to relinquish its IP address? [1]
- 10.2 What is the default behaviour of Router1 when PC0 requests service from DHCP server and why? [2]
- 10.3 Assume PC0 is configured with IPv4 and PC1 is configured with IPv6 or vice-versa; OR both PCs are configured with IPv6 but the connectivity between the two different networks separated by the serial link can only route/understand IPv4 traffic. Propose any two ways on how the two PCs can communicate. [4]

End of Paper