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: Internet and WAN Telecommunications	**COURSE CODE:** IWT711S
DATE: July 2022	**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 [13 marks]

Question 1 [13 Marks]

Below are multiple choice questions as well as True / False questions. Select the correct answers.

1.1 In a _____, a wide range of incoming waves is directed to a common point called the focus.

    a) repeater
    b) parabolic dish antenna
    c) satellite
    d) Any of the above

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

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

1.3 _____ cable carries signals of higher frequency ranges than _____ cable.

    a) Twisted-pair; coaxial
    b) Twisted-pair; fiber-optic
    c) Coaxial; twisted-pair
    d) Coaxial; fiber-optic

1.4 The purpose of a(n) _____ is to compensate for an attenuated signal loss.

    a) amplifier
    b) transmitter
    c) antenna
    d) LED

1.5 When making use of audio signals, what is the frequency range of speech?

    a) 100 Hz to 7 KHz
    b) 100 KHz to 300 KHz
    c) 5 Hz to 50 Hz
    d) 50 KHz to 70 KHz

1.6   The _____ wave is the simplest analog signal.

        a)   periodic
        b)   digital
        c)   composite
        d)   sine

1.7   In TDM, slots are further divided into _____.

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

1.8   The frequency of a signal is usually expressed in _____.

        a)   hertz
        b)   volts
        c)   decibels
        d)   seconds

1.9   The DHCPNAK is message from the client to the server in response to a DHCPREQUEST. The DHCPNAK indicates that the client does not acknowledge the request and does not agree to lease the specified IP address.

        a) False   b) True

1.10   Radio waves are converted to an electrical signal to produce sound.

        a) True   b) False

1.11   The IPv6 address 2001:0404:0001:1000:0000:0000:0EF0:BC00, can also be abbreviated as 2001:0404:0001:1000:0:0:0EF0:BC00.

        a) True   b) False

1.12   Outside Local NAT address is an IP address used to translate an outside private IP address.

        b) False   b) True

1.13   A CODEC is a device that is used to simultaneously perform the analog to digital conversion (encoding) and digital to analog conversion (decoding).

a) True   b) False

Section B [57 marks]

Question 2

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

2.1   Half-duplex   [2 marks]

2.2   Impulse noise   [2 marks]

Question 3

3.1   Explain why do you prefer to utilise ADSL rather than cable modem for internet connectivity?
                                                                                [3 marks]

3.2   What type of multiplexing method does ADSL utilises?   [1 mark]

3.3   What is the distance range does ADSL scheme provides?   [1 mark]

Question 4

4.1   Explain why you might want to configure VPN in a particular network.   [2 marks]

4.2   Outline three disadvantages of VPN.   [3 marks]

4.3   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 marks]

Question 5

5.1   Why would a network administrator choose to use an ATM Network?   [2 marks]

5.2   What is the size of an ATM payload field?   [1 mark]

5.3   Name three advantages for an ATM cell.   [3 marks]

5.4   Mention two approaches that are used in establishing an ATM connection.   [2 marks]

Question 6

Differentiate between Time Division Multiplexing and Wavelength Division Multiplexing. [4 marks]

Question 7

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

Question 8

8.1   State and explain two types of transmission medium.   [4 marks]

8.2   Name two varieties of twisted pair transmission medium.   [2 marks]

8.3   What is the use of shielding in twisted pair transmission media?   [2 marks]

Question 9

Consider figure 1 below and answer the questions that follow.
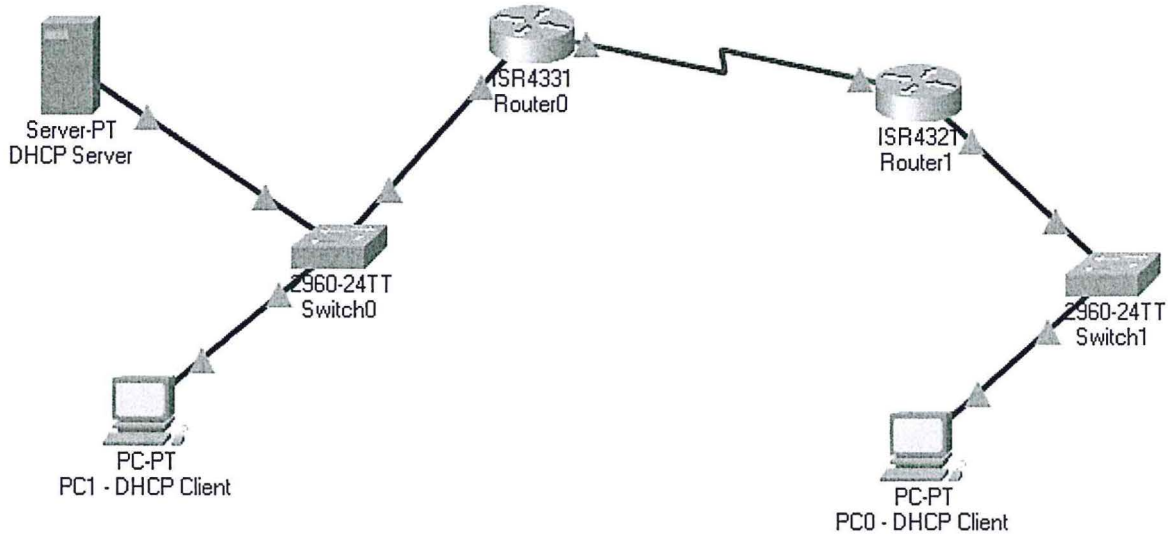

Figure 1

9.1 Briefly explain the purpose of having a DHCP server inn the topology shown in Figure 1? [2 marks]

9.2 Name the three IP address allocation mechanisms that are supported by DHCP. [3 marks]

9.3 What is the name of the DHCP packet type/message that is sent by a DHCP client to the DHCP server when the client knows that it no longer needs an IP address. [1 mark]

9.4 What is the default behaviour of Router1 when PC0 requests service from DHCP server and why? [2 marks]

9.5 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 marks]

9.6 Which DHCP concept will be configured on Router0 so that PC0 can be assigned an IP address from the DHCP server? What is the purpose of this concept? [3 marks]

End of paper

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