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: June 2022	SESSION: 1
DURATION: 2 hours	MARKS: 70

FIRST OPPORTUNITY EXAMINATION QUESTION PAPER	
EXAMINER(S)	Mr. Nasimane Ekandjo
MODERATOR:	Mr. Kudakwashe Madzima

THIS QUESTION PAPER CONSISTS OF 4 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   Which of the following is the correct network address for the IPv6 node with IPv6 address?

   a)   2000:3000:8B74:0130:2E0:8FFF:FE89:1A02/64?
   b)   2000::2E0:8FFF:FE89:1A02/64
   c)   2000:3000:8B74:0130::/64
   d)   None of the above

1.2   Which multiplexing technique involves signals composed of light beams?

   a)   TDM
   b)   FDM
   c)   WDM
   d)   None of the above

1.3   In the transmission of terrestrial microwaves _____ can regenerate the signal at each antenna.

   a)   repeaters
   b)   bridges
   c)   routers
   d)   any of the above

1.4   Which of the following is a digital multiplexing method?

   a)   FDM
   b)   Asynchronous TDM
   c)   Synchronous TDM
   d)   b and c

1.5   An ATM cell has the payload field of _____.

   a)   32 bytes
   b)   48 bytes
   c)   64 bytes
   d)   128 bytes

1.6   The _____ is the maximum value/strength of signal over time.

    a)   phase
    b)   frequency
    c)   bandwidth
    d)   peak amplitude

1.7   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
    e)   None of the above

1.8   In frame relay networks, extended address is used _____.

    a)   to increase the range of data link connection identifiers
    b)   for error detection
    c)   for encryption
    d)   for error recovery

1.9   DHCP is a TCP Service and it runs on port 21 and 23.

    a) False   b) True

1.10   IPv6 have fewer header fields compared to IPv4.

    a) True   b) False

1.11   With unguided media, the antenna is considered more important in terms of the bandwidth produced.

    a) False   b) True

1.12   Inside global – is the actual address assigned to an inside host (private address).

    b) False   b) True

1.13   In Analog WANs, modems are used to convert digital data to analog and vice versa.

    a) True   b) False

2

Section B [57 marks]

Question 2

Explain the concepts crosstalk as used in internet and WAN telecommunications. [2]

Question 3

Name two transmission impairments in wireless transmission [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 the three causes signal degradation and bit errors between signal received and signal transmitted? [3]

Question 5

5.1 Why must a satellite have distinct uplink and downlink frequencies? [2]

5.2 What factors determine antenna gain? [2]

5.3 What is the primary cause of signal loss in satellite communications? [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)   [4]

Question 7

Using your own words, explain the fundamental differences between how analog and digital signals are propagated.   [6]

Question 8

Explain two advantages and two disadvantages of twisted pair cable.   [4]

Question 9

State three advantages of IPv6 over IPv4.   [3]
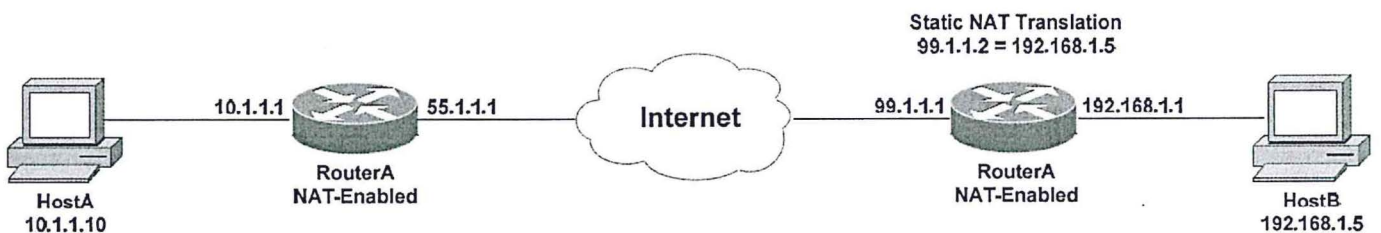
Question 10

Name and explain three factors that need to be considered when choosing the transmission media.   [6]

Question 11

11.1   What is NAT?   [2]

11.2   Explain three methods that can be used to implement NAT.   [6]

11.3   Consider the figure below and answer the questions that follows:

Consider a connection from HostA to HostB:

Identify the NAT addresses for the following: [3]

Inside Local Address: _____

Inside Global Address: _____

Outside Global Address: _____

End of paper