NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF COMPUTING AND INFORMATICS

DEPARTMENT OF COMPUTER SCIENCES

QUALIFICATION: BACHELOR OF COMPUTER SCIENCE	
QUALIFICATION CODE: 07BCCS & 07BACS	**LEVEL: 7**
COURSE CODE: WLT620S	**COURSE NAME: WIRELESS TECHNOLOGIES**
SESSION: JANUARY 2026	**PAPER: PAPER 1**
DURATION: 3 HOURS	**MARKS: 100**

SECOND OPPORTUNITY/SUPPLEMENTARY EXAMINATION QUESTION PAPER	
EXAMINER(S)	**PROF DHARM SINGH JAT**
MODERATOR:	**MS LOINI IIYAMBO**

INSTRUCTIONS

1. Answer ALL the questions in section A and any THREE questions in section B.
2. Read all the questions carefully before answering.
3. Number the answers clearly
4. NUST's examination rules and regulations apply.

THIS QUESTION PAPER CONSISTS OF THREE PAGES (Excluding this front page)

SECTION A ***[40Marks]***

*This section contains **TWO** questions.*

*Attempt **ALL** questions.*

Q1 Choose the correct answer for each of the following multiple-choice questions

[20 marks, 2 marks for each]

(i). In which layer do Wireless LANs implement security measures?

A. System Layer
B. Data Link Layer
C. Sub Layer
D. Multi-Layer

(ii). Garage door opener is a.....

A. Transmitter
B. Receiver
C. Transceiver
D. d. None of the above.

(iii). An administrator receives reports from users in an office that their 802.11g wireless connectivity has been problematic since the installation of the new wireless phone system. At which of the following frequencies is the system operating at to cause this issue?

A. 2.4GHz
B. 900MHz
C. 1.1GHz
D. 4GHz

(iv). A wireless network uses ___ waves to transmit signals.

A. Mechanical
B. Sound
C. Radio
D. Water

(v). Five channels, each with a 100kHz bandwidth, are to be multiplexed together. What is the minimum bandwidth of the link if there is a need for a guard band of 10 kHz between the channels to prevent interference?

A. 550 kHz
B. 540 kHz
C. 560 kHz
D. 500 kHz

(vi). Which multiple access technique is used by IEEE 802.11 standard for wireless LAN?

A. CDMA/CA
B. CSMA
C. ALOHA
D. None of the mentioned.

(vii). In wireless LAN, there are many hidden stations so we cannot detect the

A. Frames
B. Collision
C. Signal
D. Data

(viii). Why is the size of the cell kept small in a cellular network?

A. To increase the capacity
B. To decrease the capacity
C. To increase the size of base station electronics
D. To slow the process of handoffs

(ix). What does the term handoff refer to in mobile communication systems?

A. Forward channel
B. Switching technique
C. Roamer
D. Guard channel

(x). The carrier frequency of a TV remote control is in the range

A. 50 MHz-100 MHz
B. 500 MHz- 1 GHz
C. of Infrared
D. 1GHz- 2 GHz.

Q2 (i). Explain wireless communications. [4]

(ii). Give two advantages and two disadvantages of wireless LANs. [4]

(iii). Explain how multipath propagation affects signal quality. [4]

(iv). Explain the frequency reuse concept in GSM. [4]

(v). What is Bluetooth, and why is it classified as a wireless Personal Area Network (PAN) technology? [4]

SECTION B [60Marks]
*This section contains **FOUR** questions*
*Attempt any **THREE** questions.*

Q3 a) For a cellular system with a total bandwidth of 15 MHz uses 10 KHz simplex channels to provide full duplex voice and control channels. For 12 cell reuse patterns and 1 MHz of the total bandwidth is allocated for control channels.
(a) Calculate the total available channels. [5]
(b) Determine the number of control channels. [5]
(c) Calculate the number of voice channels per cell. [5]

b) What does SSID stand for when using a WiFi network? [5]

Q4 a) If GSM uses a frame structure where each frame consists of 8-time slots and each time slot contains 156.25 bits, and data is transmitted at 270.833 kbps in the channel, find
a) the time duration of a bit, [4]
b) the time duration of a slot, [4]
c) the time duration of a frame, and [4]
d) how long must a user occupy a single time slot must wait between two simultaneous transmissions [4]

b) Describe frequency division multiplexing techniques in wireless communication. [4]

Q5 a) What is the wavelength if the frequency of a radio wave is (a) 15 kHz, (b) 30kHz? [10]

b) What is frequency Reuse? How is it used in the GSM Cellular network? [10]

Q6 a) (i) Draw and explain the architecture of an infrastructure-based IEEE 802.11 WLAN with two access points or Basic Service Sets (BSSs). [5]
(ii) Draw and explain the architecture of IEEE 802.11 ad-hoc wireless LANs with two independent Basic Service Sets (IBSSs). [5]

b) What does SSID stand for when using a WiFi network? [5]

c) What is the use of Tethering (Hotspot) in Wireless Networks? [5]

GOOD LUCK!

NAMIBIA UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF COMPUTING AND INFORMATICS
DEPARTMENT OF COMPUTER SCIENCE
Private Bag 13388, 13 Jackson Kaujeua Street, Windhoek, Namibia
Tel: +264-(0)61–207–2052 Fax: +264–(0)61–207–2051

Curriculum:	Bachelor of Computer Science
Subject Code:	SAD622S
Subject:	Systems Administration
Date:	December 2025
Duration:	120 minutes
Paper:	Theory
Total Marks:	80

2nd Opportunity Examination Paper

Lecturer/First Examiner : Peter Gallert
Moderator : Isaac Nhamu

This examination paper consists of 4 pages (including the front page).

Student Name: _____

Student Number: _____

Instructions

1. Answer all questions.
2. When answering questions you should be led by the allocation of marks.
3. Do not use or bring into the examination venue books, mobile devices and other material that may provide you with unfair advantage. Should you be in possession of one right now, draw the attention of the examination officer or invigilator.
4. NUST's examination rules and regulations apply.