MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

MAIN CAMPUS

UNIVERSITY EXAMINATIONS

2023/ 2024 ACADEMIC YEAR

SECOND YEAR FIRST SEMESTER EXAMINATIONS

BACHELOR OF COMPUTER SCIENCE

COURSE CODE: BCS 214

COURSE TITLE: DATA COMMUNICATION SYSTEMS

DATE: 13/12/2023   **TIME:** 12.00 – 02.00 PM.

INSTRUCTIONS TO CANDIDATES

Question ONE (1) and Any OTHER 2 questions

TIME: 2 Hours

MMUST observes ZERO tolerance to examination cheating

Question One (30 Marks)

a) Draw a labeled block diagram of a communication system, [8 Marks]

b) i) Discuss 2 reasons for modulation and demodulation in data communication [4 Marks]

ii) The value of the resistor creating thermal noise is doubled. The estimate noise power factor generated [3 Marks]

c) OUTLINE 2 advantages of digital transmission over analogue transmission [4 Marks]

d) Briefly explain simplex, half –duplex and full-duplex channel, [6 Marks]

e) Differentiate between guided media and unguided media, state one advantage of each [5 Marks]

Question Two (20 Marks)

a) Explain ADC and DAC in data communication [6 Marks]

b) Differentiate between synchronous and asynchronous transmission [4 Marks]

c) List 2 advantages and 2 disadvantages of FM over AM [4 Marks]

d) State 2 reasons Amplitude modulation is used for broadcasting [4 Marks]

e) The modulation index of an AM is changed from 0 to 1. Estimate the change in transmitted power

[2 Marks]

Question Three (20 Marks)

a) Using suitable diagrams explain Amplitude shift keying, Frequency shift keying and explain their application [8 Marks]

b) Explain 3 types of signal impairments and how they can be minimized [6 Marks]

c) Differentiate between baseband and broadband transmission [6 Marks]

Question Four (20 Marks)

a) Draw a block diagram of CDMA spread spectrum and explain how the system operates. [8 Marks]

b) Differentiate between GSM technology and CDMA Technology [6 Marks]

c) Explain about Voice Over Internet Protocol. [6 Marks]

Question Five (20 Marks)

a) Describe 3 types of noise in telecommunication and electronics [6 Marks]

b) Explain circuit switching, message switching and packet switching [6 Marks]

c) Explain

    i) Block encoding [3 Marks]
    ii) Encapsulation [2 Marks]
    iii) Parallel & Serial Transmission [3 Marks]