



(University of Choice)

**MASINDE MULIRO UNIVERSITY OF  
SCIENCE AND TECHNOLOGY  
(MMUST)**

MAIN CAMPUS

**UNIVERSITY EXAMINATIONS  
2021/2022 ACADEMIC YEAR**

**SECOND YEAR FIRST SUP/SPECIAL EXAMINATIONS**

**BACHELOR OF COMPUTER SCIENCE**

**COURSE CODE: BCS 214**

**COURSE TITLE: DATA COMMUNICATION SYSTEMS**

**DATE: THURSDAY 28-07-2022 TIME: 8.00a.m. – 10.00a.m.**

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**INSTRUCTIONS TO CANDIDATES**

Question ONE (1) and Any OTHER 2 questions

TIME: 2 Hours

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 2 Printed Pages. Please Turn Over. ►

- Q1 a) Draw a labeled block diagram of a communication system, 8mks
- b) i) Discuss 2 reasons for modulation and demodulation in data communication 4mks
- ii) The value of the resistor creating thermal noise is doubled. The estimate noise power factor generated 3mks
- c) OUTLINE 2 advantages of digital transmission over analogue transmission 4mks
- 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
- Q2a) Explain ADC and DAC in data communication 6mks
- b) Differentiate between synchronous and asynchronous transmission 4 Marks
- c) List 2 advantages and 2 disadvantages of FM over AM 4mks
- d) State 2 reasons Amplitude modulation is used for broadcasting 4 marks
- d) The modulation index of an AM is changed from 0 to 1. Estimate the change in transmitted power 2 marks
- Q3 a) Using suitable diagrams explain Amplitude shift keying, Frequency shift keying and explain their application 8mks
- b) Explain 3 types of signal impairments and how they can be minimized 6mks
- c) Differentiate between baseband and broadband transmission 6mks
- Q4 a) Draw a block diagram of CDMA spread spectrum and explain how the system operates. 8mks
- b) Differentiate between GSM technology and CDMA Technology 6mks
- c) Explain about Voice Over Internet Protocol. 6mks
- Q5 a) Describe 3 types of noise in telecommunication and electronics 6mks
- b) Explain circuit switching, message switching and packet switching (6 marks)
- c) Explain (i) Block encoding 3 marks  
(ii) Encapsulation 2 mark  
iii) Parallel & Serial Transmission 3 marks