



(Knowledge for Development)

**KIBABII UNIVERSITY**  
(KIBU)

**UNIVERSITY EXAMINATIONS**  
**2022/2023 ACADEMIC YEAR**

**SPECIAL/SUPPLEMENTARY EXAMINATION**  
**YEAR ONE SEMESTER TWO EXAMINATION**

**FOR THE DEGREE**  
**INFORMATION TECHNOLOGY**

**COURSE CODE : BIT 125**  
**COURSE TITLE : INTRODUCTION TO DATA COMMUNICATION**

**DATE: 08/08/2023**

**TIME: 2.00PM. -4.00 PM.**

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**INSTRUCTIONS TO CANDIDATES**

**ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS**

### QUESTION ONE (30 MARKS) [COMPULSORY]

- a. Define the following terms [2 Marks]
- Data (with respect to data communication)
  - Telecommunication
- b. State the name of the protocol responsible for security at the presentation layer [1 Mark]
- c. The transport layer can be either connectionless or connection oriented. Distinguish between these two modes of transmission [4 Marks]
- d. Contrast between periodic signal and aperiodic signal [4 Marks]
- e. Outline two different OSI model layers responsible for error control. [2 Marks]
- f. Define a DC component and describe its effect on digital transmission. [3 Marks]
- g. The power used at a home has a frequency of 60 Hz. Determine the period of this sine wave. [3 Marks]
- h. Determine the bandwidth of a periodic signal is decomposed into five sine waves with frequencies of 200, 300, 500, 700, and 800 Hz. [3 Marks]
- i. Explain the relationship between period and frequency. [4 Marks]
- j. With the aid of examples, explain how a web browser differs from a search engine. [4 Marks]

### QUESTION TWO (20 MARKS)

- a. Explain the difference between half-duplex and full-duplex transmission modes and state an advantage of each. [4 Marks]
- b. Briefly describe four major categories of unguided media technologies. [8 Marks]
- c. Discuss any two protocols for noiseless channels and any two protocols for noisy channels [8 Marks]

### QUESTION THREE (20 MARKS)

- a. Contrast between telephone network and the internet. [4 Marks]
- b. Describe THREE fundamental characteristics which determine the effectiveness of a data communication system. [6 Marks]
- c. With the aid of a diagram, describe the components of a data communication system. [10 Marks]

### QUESTION FOUR (20 MARKS)

- a. Describe any THREE types of network transmission impairment. [6 Marks]

- b. Briefly describe three major classes of guided media [6 Marks]
- c. List four major components of a packet switch and describe their functions. [8 Marks]

**QUESTION FIVE (20 MARKS)**

- a. Define the term line code hence explain its function. [2 Marks]
- b. Describe Five different line coding schemes [10 Marks]
- c. The network layer provides two reliable services – switching and routing. Contrast between the two. [4 Marks]
- d. Explain two advantages of combining the session, presentation, and application layer in the OSI model into one single application layer in the Internet model. [4 Marks]