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*(Knowledge for Development)*

**KIBABII UNIVERSITY**

**(KIBU)**

**UNIVERSITY EXAMINATIONS  
2018/2019 ACADEMIC YEAR  
END OF SEMESTER EXAMINATIONS  
YEAR TWO SEMESTER TWO EXAMINATIONS**

**FOR THE DEGREE OF  
BACHELORS OF SCIENCE  
(INFORMATION TECHNOLOGY)**

**COURSE CODE: BIT 125**

**COURSE TITLE: DATA COMMUNICATION**

**DATE: 28/05/2019**

**TIME: 9.00A.M. – 11.00A.M.**

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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]  
i. Data communication  
ii. Signal
- b. Describe any three transmission modes. [6 Marks]
- c. Identify any four advantages of optical fiber over twisted-pair and coaxial cable. [4 Marks]
- d. John intends to use unguided transmission medium for his company's network. Explain two limitations of this medium. [4 Marks]
- e. Differentiate between parallel and serial transmission. [2 Marks]
- f. Explain the difference between pulse rate and bit rate. [2 Marks]
- g. Distinguish between frequency and amplitude. [2 Marks]
- h. Kibabii University has installed wireless Internet in the student's hostels. Explain any three benefits that the students will realize from this installation. [6 Marks]
- i. Differentiate between intranet and extranet as used in data communication. [2 Marks]

**QUESTION TWO (20 MARKS)**

- a. Distinguish between data rate and signal rate. [2 Marks]
- b. With the aid of a well labelled diagram describe the five components of a data communications system. [12 Marks]
- c. Describe any three techniques of digital-to-digital conversion. [6 Marks]

**QUESTION THREE (20 MARKS)**

- a. i. What is line coding? [1 Mark]  
ii. Describe any three techniques of line coding. [6 Marks]
- b. Represent the bit sequence 01001110 using both Manchester and differential Manchester encoding. [6 Marks]
- c. Discuss the concept of redundancy in error detection and correction. [3 Marks]
- d. Identify the characteristics of an analog signal that are changed to represent the digital signal in each of the following digital-to-analog conversion. [4 Marks]  
i. ASK  
ii. FSK  
iii. PSK  
iv. QAM

**QUESTION FOUR (20 MARKS)**

- a. Differentiate between random access and controlled access. [2 Marks]
- b. Describe any three main multiplexing techniques. [6 Marks]
- c. Describe any three protocols in random access category and three protocols in controlled access category. [12 Marks]

**QUESTION FIVE (20 MARKS)**

- a. Identify any three major components of a packet switch. [3 Marks]
- b. Discuss any three examples of network transmission impairments. [9 Marks]
- c. Explain any two advantages and two disadvantages of twisted Pair Cable. [8 Marks]