**NAIROBI INSTITUTE OF BUSINESS STUDIES**

**DEPARTMENT OF COMPUTER SCIENCES**

**DIPLOMA IN INFORMATION TECHNOLOGY (KNEC)**

**END TERM EXAMINATION– MARCH 2014**

**TIME ALLOWED: 3 HOURS**

**DATA COMMUNICATION AND NETWORKING**

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| **INSTRUCTIONS:**   1. Answer all the **FIVE** questions. 2. Time allowed is **3hrs.** 3. Each question carry’s equal marks. 4. Mobile phones should be switched off. |

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**Question 1**

1. Explain **two** advantages of UTP over coax cable in networking. (4 marks)
2. Outline **one**  characteristic of each of the following data communication modes:
3. Simplex mode
4. Half-duplex mode (4marks)
5. Explain **two** factors that led to the emergence of OSI reference model. (4marks)
6. Outline **three** data transmission impairments (3 marks)

**Question 2**

1. The human voice contains frequencies from 0-4000Hz, assuming 8 bits per sample, calculate:
2. The sampling rate based on Nyquist theorem (3 marks)
3. Bit rate (3 marks)

1. Explain **TWO** services offered by the session layer of the OSI reference model (4 marks)
2. Explain **ASK**, **FSK** and **PSK** as techniques used for encoding signals. (5 marks)

**Question 3**

1. With an aid of a diagram, describe the **star bus** topology (4 marks)
2. Explain **three** aspects of a sine wave. (3 marks)
3. Outline **FOUR** analog to digital modulation techniques (4marks)
4. Explain the term **multiplexing** and name **two** techniques employed in multiplexing.

(4 marks)

**Question 4**

1. Explain **five** reasons why digital transmission is preferred over analog transmission. (15marks)

**Question 5**

1. State the use of each of the following Ethernet Cables:
   1. 10BaseT
   2. 10Base5 (4marks)
2. Identify **three** situations where the use of satellite transmission would be preferred over guided media. (3 marks)
3. With an aid of a diagram, describe **statistical time division** multiplexing as used in data communication and state **two** advantages of it. (8 marks)