KIBABII UNIVERSITY COLLEGE
(A Constituent College of MasindeMuliro University of Science Technology)
P.O. Box 1699-50200 Bungoma, Kenya
Tel. 020-2028660/0708-085934/0734-831729
E-mail: enquiries@kibabiiuniversity.ac.ke

UNIVERSITY REGULAR EXAMINATIONS

2012 /2013 ACADEMIC YEAR

FOR THE DEGREE OF BACHELOR OF

BACHELOR OF SCIENCE (COMPUTER SCIENCE)

COURSE CODE: CSC 223

COURSE TITLE: DATA COMMUNICATION

DATE: 19th August 2013 **TIME:** 9.00 am - Noon

INSTRUCTIONS

Answer Question **ONE** and any other **TWO** questions from the following five questions

QUESTION ONE 30 MARKS

(a) Distinguish between the following characteristics of data communication system (4 marks)

(i) Delivery & Accuracy

(ii) Timeliness and jitter

(b) With aid of block diagram describe the element of data communication system (10 marks)

(c) The loss in a cable is usually defined in decibels per kilometer (dB/km). If the signal at the beginning of a cable with -0.5 dBlkm has a power of 2 mW, what is the power of the signal at 10 km? (4 marks)

(d) We need to send 265 kbps over a noiseless channel with a bandwidth of 20 kHz. How many signal levels do we need? We need to send 265 kbps over a noiseless channel with a bandwidth of 20 kHz. How many signal levels do we need? (4 marks)

(e) With aid of expression and diagram show where a digital signal requires a wideband channel for transmission (8 marks)

Let us show the components of a square wave signal as seen in Figure C.6. The figure also shows the time domain and the frequency domain. According to the figure, such a square wave signal has only *An* coefficients. Note also that the value of*Ao*=0 because the average value of the signal is 0; it is oscillating above and below the time axis. The frequency domain of the signal is discrete;

QUESTION TWO (20 MARKS)

(a)Discuss Detection Versus Correction (5 marks)

(b)With aid of diagram explain the idea behind in error detection Coding 6 marks

C (i) Table 10.2 illustrate code for error correction suppose dataword 01 the codeword received is 01001 illustrate how the system can correct the error.

Table 10.2 *A code for error correction (Example 10.3)*

Dataword	*Codeword*
00	00000
01	01011
10	10101
11	11110

C(ii) Determine the Hamming code for table 10.2

QUESTION THREE (20 MARKS)

With aid of diagram discuss cyclic redundancy check (CRC)

Question Four (20 marks)

(a)With aid of diagram explain the taxonomy of switched network (8 marks)

(b)Explain salient feature of circuit switching (4 marks)

(c) Explain the salient virtual circuit (5 marks)

(d) Outline any three Types transmission media (3 marks)

QUESTION FIVE (20 MARKS)

(a)Calculate the theoretical highest bit rate of telephone line and suggest ways of increasing the bit rate (6 marks)

(b) What are the propagation time and the transmission time for a 2.5-kbyte message (an e-mail) if
the bandwidth of the network is 1 Gbps? Assume that the distance between the sender and the receiver is 12,000 km and that light travels at 2.4×10^8 *mls.* *(4 marks)*

(c) Describe the five categories of line coding schemes