

ITEMS PAST PAPERS
TECHNICAL

SIR ARTHUR LEWIS COMMUNITY COLLEGE
DIVISION OF TECHNICAL EDUCATION AND MANAGEMENT STUDIES

EXAMINATION SESSION : End of Semester One Examination

TUTOR : Annie Sealy-Auguste & Kurt Harris

PROGRAM TITLE : Computer Systems Engineers
Electronics Systems and Communications
Engineers

PROGRAM CODE : 3EE-CMS-AD, 3EE-ESC-AD

COURSE TITLE : Data Communications

COURSE CODE : ELE 210

CLASS : Year 2

DATE : Wednesday, December 5th, 2007

COMMENCEMENT TIME : 9:00 AM

DURATION : 2½ Hrs.

ROOM : CMT-W1, ELS-W1

INVIGILATOR(S) : **L. Philbert**, Mr. F. Combie,
K. Numa, Ms. S. Toussaint

INSTRUCTIONS

There are *twelve (12)* questions on this exam paper. Please answer *all* questions. Place your name on all sheets of paper submitted to the invigilator. This is a closed book exam. Calculators are permitted. The maximum number of marks is indicated at the end of each question. Use this as a rough guide to determine the depth to which each question will need to be answered. You have *two and a half (2 1/2)* hours to complete this exam.



GOOD LUCK!!

1. (a) What does ISO stand for and what is the role of this organization? (3 marks)

(b) What is the name of the organization in St. Lucia that plays a role similar to that of the ISO? (1 mark)

(c) What is meant by **Standards** and list three advantages of standards? (4 marks)

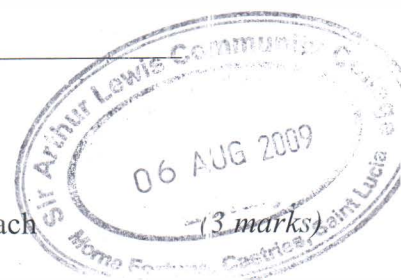
2. (a) Define the term medium (1 mark)

(b) List two (2) types of transmission medium (2 marks)

(c) Compare the two transmission medium listed in (b) above (2 marks)

3. (a) Define the term **Microwave** as it relates to Data Communications (2 marks)

(b) List three (3) radio communication systems, citing 1 application of each (3 marks)



- (c) A DTE is made up of three sections as shown in the diagram below. Use the information given in the diagram to calculate the output power and all the input and output powers of each stage.



(5 marks)

4. (a) What is meant by modulation as it relates to Data Communications?

(1 mark)

- (b) List two (2) types of modulation used commonly in Data Communications (Complete names only)

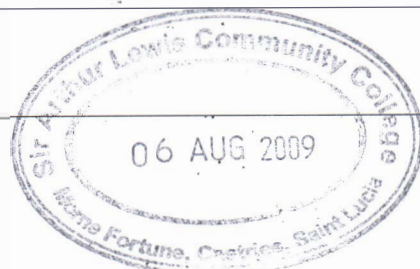
(2 marks)

- (c) List one application of each modulation technique listed above

(2 marks)

- (d) Briefly explain the modulation technique FM

(2 marks)



5. (a) Sketch the waveforms of the asynchronous characters specified

| No. of data bits | Parity | Character Value |
|------------------|--------|-----------------|
| 6 | Odd | BD |

(5 marks)

(b) Explain how a Framing and Receiver Overrun and Parity error can occur in a UART

(6 marks)

6. (a) Differentiate between Congestion and Deadlock

(2 marks)

(b) Explain how Resource Reservation and Token Bucket work as preventative methods of Congestion Control

(4 marks)

(c) Explain two Reactive methods of congestion control

(4 marks)

7. (a) Explain the operation of circuit switching in a PSTN

(4 marks)



- (b) Differentiate between the operation of the packet switching concepts of the datagram and the virtual circuit (4 marks)

8. (a) Differentiate between Hot Potato and Random Walk Routing (4 marks)

- (b) Explain how Backward learning is used on a network (3 marks)

9. A message is transmitted over an asynchronous serial data link at 19.2K bits per second, using EBCDIC, maximum stop interval and even parity. What is the minimum time needed to send the following message?

“Datagrams and Virtual Circuits” (5 marks)



10. (a) Explain, with illustrations, why some errors may not be detected by parity checking.

(2 marks)

(b) Describe how the CRC scheme is used for error detection:

(4 marks)

11. (a) By means of a labeled diagram, show the structure of an HDLC Information Frame

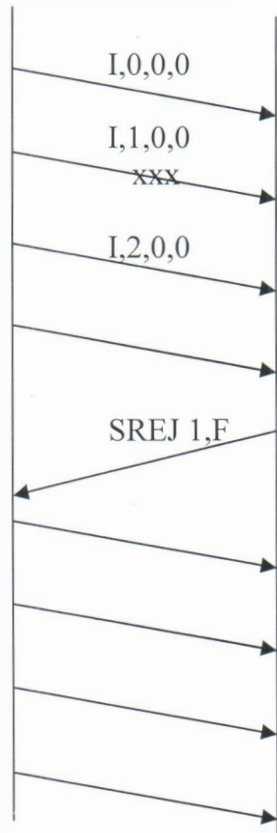
(6 marks)

(b) Explain how the HDLC protocol ensures that the flag does not occur accidentally in data

(4 marks)



12. (a) The diagram below shows a two-way alternate data exchange such as that used by the data link layer. Explain the sequence of events, making clear the significance of the symbol above each arrow and inserting the missing information (11 marks)



- (b) Differentiate between the BSC protocol's Idle RQ and Go Back N ARQ (2 marks)



END OF EXAMINATION