

DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION TECHNOLOGY

DIPLOMA IN I.T-DIT2K10J

ECT2309 **DATA COMMUNICATIONS II**

SECTION A COMPULSORY

QUESTION 1

- a) Give definition of the following terms
- i) Non- Return-to-Zero Level (2 marks)
  - ii) Longitudinal Redundancy generator (2 marks)
  - iii) User Datagram Protocol (2 marks)
  - iv) Burst-error (2 marks)
- b) Explain the consequences of the session layer failure in the OSI- model (6 marks)
- c) Assume that a computer wants to send the word "USER"

Character	Ascii code
U	1010101
S	1010011
E	1000101
R	1010010

- i) Explain how the Vertical Redundancy Check technique is used to detect error during transmission of this data based on even parity bit method (4 marks)
  - ii) Give one major shortcoming of the Vertical Redundancy Check method (2 marks)
- d) Using a data signal of the bit stream 10110011
- i) sketch the signal word to the encoded digital in a Bi-phase digital encoding. (4 marks)
  - ii) state the three advantages of the Bi-phase encoding scheme over NRZ scheme (6 marks)

QUESTION 2

- a) Discuss five factors to determine network security in an institution (5 marks)
- b) Given the data 010011, sketch the encoded signals on the same frame if the following encoding schemes are used (10 marks)

- i) Manchester
- ii) Differential Manchester
- iii) NRZ-I

### QUESTION 3

- a) Given a digital signal data: 110110, predetermined divisor:1101
  - i) Show by calculation how to generate the CRC (5 marks)
  - ii) Show by calculation how the signal is checked for errors (5 marks)
- b) Study the data below and answer the questions that follow
  - $F(x)=1001001$
  - $G(x)=11$
  - i) Represent the data in polynomial form (2 marks)
  - ii) Calculate  $f(x) \times g(x)$  in polynomial form (3 marks)

### QUESTION 4

- a) With aid of a diagram drawn on the same axis, describe the following encoding techniques (5 marks)
  - i) Non-Return-to-Zero
  - ii) Manchester(Bi-phase)
  - iii) Differential Manchester

NB: Assume the bit pattern is 0111000110

- b) Explain five techniques of enhancing data security in an organization (10 marks)

### QUESTION 5

- a) explain the following functions of the transport layer
  - i) service point Addressing (3 marks)
  - ii) Flow control (3 marks)
  - iii) Segmentation (3 marks)
- b) Draw a diagram to illustrate the difference between hop-to-hop and end-to-end data delivery

(7 marks)