

**NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF APPLIED SCIENCE
COMPUTER SCIENCE DEPARTMENT
DECEMBER 2002 EXAMINATIONS**

**SUBJECT: COMPUTER DATA COMMUNICATIONS
CODE: SCS 2101**

Instructions to candidate:

1. Answer any **3** questions from Section A and any **two** questions from Section B

3 HOURS

SECTION A

QUESTION ONE

- a) Data communications is not the same thing as data transmission. Explain. Include in your answer suitable practical examples to illustrate these concepts. [3]
- b) With detail practical examples, identify and discuss the basic requirements of data communication systems. [7]
- c) Briefly discuss five applications of data communications and computer networks. Include in your answer the data communications aspects and the network aspects of the identified applications. [10]

QUESTION TWO

Write a short note on each of the following data communications concepts.

- i. End-nodes vrs. Intermediate nodes [3]
- ii. Switched vrs. Broadcast networks [3]
- iii. Modes of transmission (simplex, half-duplex, full-duplex) [3]
- iv. Synchronous vrs. Asynchronous transmission [5]
- v. Pooling vrs. Contention [3]
- vi. DTE vrs. DCE [3]

QUESTION THREE

Outline two flow control techniques. [20]

QUESTION FOUR

In Data communications how does the Parity Error Detection and Correction method work? Use an example to explain. Which errors can be detected and which cannot? Would you expect that the addition of a parity bit would change the probability of receiving a correct message? Why or why not? [20]

SECTION B

QUESTION FIVE

- a) What is the rationale behind the OSI Reference model? Identify and describe the basic functional aspects of the identified application. [10]
- b) Write a detailed note on peer-to-peer and client-server networking concepts. Illustrate your answer. [5]
- c) (i) Distinguish between digital transmission and analog transmission. [3]
(ii) What is a modem? Is a modem required for an end-to-end digital transmission? [2]

QUESTION SIX

- a) What are medium access control (MAC) methods? Describe the following MAC methods. CSMA/CD, CSMA/CA, Demand Priority Access and Token Passing. [5]
- b) Write a detailed note on packetizing. Include in your answer a discussion of packet-switching networks, and types of packet-switching services. [5]
- c) What are cabling diagrams and cabling installation plans within the context of network design and implementation? [5]
- d) Why is it useful to have more than one possible path through a network for each pair of stations? [5]

QUESTION SEVEN

Describe the primary purpose of the following devices in a network. At which OSI layer does each one operate?

- a) Repeater [6]
- b) Bridge [6]
- c) Router [8]

END OF QUESTION PAPER

GOOD LUCK!