

Name: _____ Index No. _____ / _____

2209/302
DATA COMMUNICATION
November 2012
Time: 3 hours

Candidate's Signature: _____

Date: _____



THE KENYA NATIONAL EXAMINATIONS COUNCIL
DIPLOMA IN INFORMATION TECHNOLOGY
MODULE III

DATA COMMUNICATION

3 hours

INSTRUCTIONS TO CANDIDATES

*Write your name and index number in the spaces provided above.
Sign and write the date of the examination in the spaces provided above.
Answer any FIVE of the EIGHT questions in this paper.
All your answers should be written in the spaces provided in this question paper.
All questions carry equal marks.
Maximum mark for each part a question are as indicated.*

For Examiner's use only

Question	1	2	3	4	5	6	7	8	TOTAL
Marks									

This paper consists of 16 printed pages.

Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

1. (a) Define each of the following data flow control schemes:
- (i) windowing;
 - (ii) buffering.
- (4 marks)
- (b) Explain each of the following terms as used in computer networking:
- (i) end system;
 - (ii) autonomous system;
 - (iii) intermediate system.
- (6 marks)
- (c) Mizinga Institute of technology intends to inter-network all its branches in town. Explain **three** reasons that could have influenced this decision.
- (6 marks)
- (d) Differentiate between amplitude shift keying and frequency shift keying as used in data encoding.
- (4 marks)
2. (a) (i) Define the term signal as used in data communication. (2 marks)
- (ii) Explain **two** advantages of pulse code modulation. (4 marks)
- (b) The following data bits **11101001** are to be transmitted via a digital link. Assuming that the link uses one of the following encoding schemes, draw the line code of the data for each scheme:
- (i) non return to zero;
 - (ii) bi-phase;
 - (iii) bipolar AMI;
 - (iv) delay modulation.
- (8 marks)
- (c) Figure 1 shows packets being transmitted by asynchronous transmission system. Identify the parts labelled I, II, III and IV.

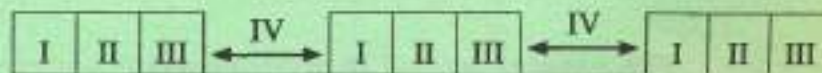


Figure 1

(2 marks)

- (d) Differentiate between digital PBX and integrated services digital network (ISDN) as used in data communication. (4 marks)
3. (a) Define the following terms as used in the Internet:
- (i) online chat;
 - (ii) prodigy;
 - (iii) website.
- (6 marks)
- (b) Explain **three** negative effects of the Internet to the society. (6 marks)
- (c) Describe the application of each of the following multiplexing schemes:
- (i) Code Division Multiplexing;
 - (ii) Frequency Division Multiplexing.
- (8 marks)
4. (a) (i) With the aid of a diagram describe phase shift keying as used in data communication. (3 marks)
- (ii) Explain the function of a modem in data communication system. (2 marks)
- (b) Assuming an OSI reference model, describe the communication of two computers through a dedicated link. (11 marks)
- (c) Differentiate between static and dynamic address assignment as used in IP addressing. (4 marks)
5. (a) Define each of the following terms as used in a networking:
- (i) tracerouter;
 - (ii) flooding.
- (4 marks)
- (b) Explain each of the following terms as used in data communication:
- (i) point to point data link;
 - (ii) delay distortion.
- (4 marks)

- (c) The management of Hankal College intends to install a database system on their LAN. Outline **four** data security principles they could incorporate in the system. (4 marks)
- (d) (i) Rahisi college has connected its computers to a remote server using PSTN. Explain the **two** types of telephone connections that could have been used. (4 marks)
- (ii) With the aid of a diagram, describe the structure of an ATM cell as used in data communication. (4 marks)
6. (a) (i) List **two** disadvantages of packet switching as applied in data communication systems. (2 marks)
- (ii) Explain **two** characteristics of a coaxial cable. (4 marks)
- (b) Explain the following protocols as used in Internet:
- (i) Address resolution;
- (ii) Hello. (4 marks)
- (c) A graduate from a mass media college intends to establish a radio station that would use the frequency modulation (FM). Explain **three** advantages of using this technique. (6 marks)
- (d) John, a technician, intends to install a LAN with two segments using the following devices: 6 computers, 2 hubs, UTP cables and a repeater. Draw a network layout for the LAN clearly labelling the devices. (4 marks)
7. (a) Outline **four** functions of a router in a data communication system. (4 marks)
- (b) State the importance of each of the following in a network:
- (i) ventilation;
- (ii) smoke detector;
- (iii) air conditioning. (6 marks)
- (c) With the aid of a block diagram, describe a typical data communication system. (6 marks)
- (d) Differentiate between RS 485 and RS 233 working standard interfaces. (4 marks)

8. (a) Define the term distributed systems as used in networking. (2 marks)
- (b) Explain the function of each of the following parts of the IPv4 packet header:
- (i) identification;
 - (ii) explicit congestion notification;
 - (iii) header checksum. (6 marks)
- (c) Mbogo, a technician, would like to differentiate between single mode and multimode fibre optic cables. Outline **four** distinct characteristics of each of the cables. (8 marks)
- (d) Sketch a signal path for a satellite link from a broadcaster's studio and BTH viewers. (4 marks)

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