

Name _____

Index No. _____

2209/302

DATA COMMUNICATION

June/July 2013

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 examination in the spaces provided above.

Answer any FIVE of the EIGHT questions in the spaces provided.

ALL questions carry equal marks.

Maximum marks for each part of a question are as shown.

Candidates should answer the questions in English.

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) (i) Outline **two** methods that could be used to secure data being transmitted via Internet. (2 marks)
- (ii) Explain each of the following terms as used in the Internet:
- I. domain naming system (DNS); (2 marks)
 - II. search engine; (2 marks)
 - III. hotspot. (2 marks)
- (b) James was required to set up an Internet connection for his company's LAN. Outline **five** factors he could consider before carrying out the task. (5 marks)
- (c) (i) Outline **three** advantages of using IEEE 802.5 standard in a computer network. (3 marks)
- (ii) Differentiate between *unicast* and *multicast* addresses as used in a computer network. (4 marks)
2. (a) Explain each of the following terms as used in the IEEE 802.3 configurations:
- (i) slot time; (2 marks)
 - (ii) collision. (2 marks)
- (b) Differentiate between *logical link control (LLC)* and *media access control (MAC)* as used in OSI model. (4 marks)
- (c) Figure 1 shows the taxonomy of a switched network. Use it to answer the question that follows.

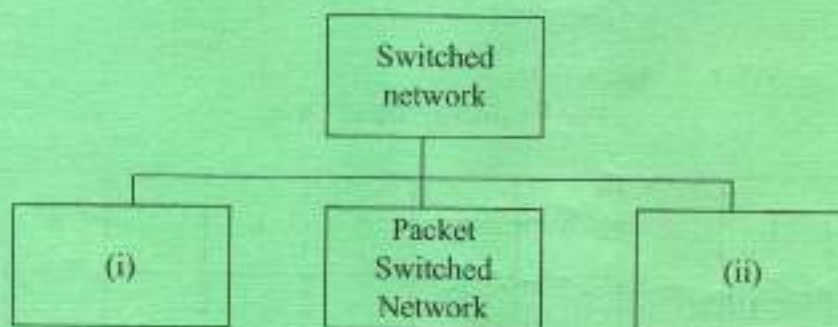


Figure 1

Identify the type of the switched network labelled (i) and (ii) giving **one** example in each case. (4 marks)

- (d) For each of the following tasks identify the most appropriate Internet service justifying your answer:
- (i) real-time direct transmission of text-based messages from sender to receiver; (2 marks)
 - (ii) subscribing for a weekly company electronic news; (2 marks)
 - (iii) command line remote access to a network server; (2 marks)
 - (iv) transmitting messages over networks for a designated user account. (2 marks)

3. (a) Explain each of the following terms as used in the Internet configurations:

- (i) top-level-domain; (2 marks)
 - (ii) URL. (2 marks)
- (b) (i) Outline **two** limitations of bus topology network. (2 marks)
- (ii) Differentiate between *fixed* and *flooding* routing techniques as used in computer networks. (4 marks)
- (c) (i) Describe the term *channel* as used in data communication. (2 marks)
- (ii) Base-X Company Ltd was contemplating to use ISDN on the company's network. Explain **two** benefits that the company could realize using this service. (4 marks)
- (d) A group of Module II students were carrying out an assignment on various error detection schemes used in data communication systems. Describe **two** schemes they could mention. (4 marks)

4. (a) (i) Outline **three** disadvantages of *shortest path routing algorithms* techniques as used in data communication. (3 marks)
- (ii) With the aid of a diagram, describe how OSI model overlays with TCP/IP model. (5 marks)
- (b) Paulina a network consultant was hired by a certain company to carry out network planning for a proposed network design. Explain **two** stages she could follow while carrying out the task. (4 marks)
- (c) Alexander intends to design a local area network for a certain company. Outline **four** factors that he should consider in the design. (4 marks)

- (d) Edu intends to setup a tree topology to expand his company's network. Explain **two** advantages of this topology that could be realized. (4 marks)
5. (a) (i) Outline **three** reasons why CSMA/CD could not be implemented on a wireless network. (3 marks)
- (ii) Differentiate between *spamming* and *flaming* as used in the Internet surfing. (4 marks)
- (b) XYZ Company Ltd. recently installed a distributed network. Explain **two** benefits the company could realize. (4 marks)
- (c) With the aid of a diagram, describe the *Thick-net* Ethernet. (5 marks)
- (d) Safe Company Ltd. intends to replace their frequency division multiplexing (FDM) system with a time-division (TDM) multiplexing system. Outline **four** advantages the company could realize. (4 marks)
6. (a) (i) Explain the term *self-clocking signal* as used in data encoding. (2 marks)
- (ii) Outline **three** components of data communication system. (3 marks)
- (b) Outline the procedure that could be used when configuring a new computer in order to connect the Internet via modem. (5 marks)
- (c) Kate replaced POP protocol with IMAP4 on her email server. Outline **five** extra functions that IMAP4 could provide compared to POP protocol. (5 marks)
- (d) Judy, a network technician with a certain college was troubleshooting a laptop that was unable to connect to the colleges wireless network despite the fact that both wireless card and router were switched on. Outline **four** possible causes that could have been the impediment. (5 marks)
7. (a) (i) Outline **two** characteristics of a 100 Base TX network. (2 marks)
- (ii) With the aid of a diagram, describe the operation of FDDI dual ring network. (5 marks)
- (b) Joshua was contemplating to introduce Internet in his company's network. Outline **four** threats he could be exposing the network to. (4 marks)
- (c) (i) Outline **three** data transmission impairments. (3 marks)
- (ii) Describe the term *phishing* as used in the Internet. (2 marks)
- (d) Distinguish between *data* and *signal* as used in data encoding. (4 marks)

8. (a) Figure 2 shows a typical toolbar in a browser program. Use it to answer the question that follows.

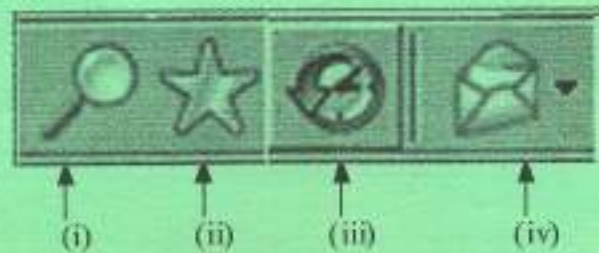


Figure 2

State the function for each of the tools labelled (i), (ii), (iii) and (iv). (4 marks)

- (b) (i) Outline **two** limitations of *UTP* cable. (2 marks)
- (ii) John, an intern was required to give a presentation on data link layer of OSI model. Outline **four** roles he could have mentioned on his presentation. (4 marks)
- (c) (i) Outline **two** functions of a network interface card (NIC). (2 marks)
- (ii) With the aid of a diagram, describe the 802.3 Ethernet frame. (8 marks)

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