

2920/301
DATA COMMUNICATION AND
NETWORKING
July 2019
Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL
DIPLOMA IN INFORMATION COMMUNICATION TECHNOLOGY

MODULE III

DATA COMMUNICATION AND NETWORKING

3 hours

INSTRUCTIONS TO CANDIDATES

*This paper consists of **EIGHT** questions.
Answer any **FIVE** questions in the answer booklet provided.
Candidates should answer the questions in English.*

This paper consists of 4 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) Explain **three** advantages of extranet networks in organizations. (6 marks)
- (b) A network design should meet several user needs. Outline **four** examples of such needs. (4 marks)
- (c) Differentiate between information security and network infrastructure security. (4 marks)
- (d) Routing protocols use routing tables to establish the source and destination of data packets in transit. Explain **three** routing path determination methods used by these protocols. (6 marks)
2. (a) (i) Outline **two** characteristics of a point to point protocol (PPP). (2 marks)
- (ii) Distinguish between *network* and *host* addresses as used in IP sub-netting. (4 marks)
- (b) With the aid of a diagram, describe a time-division multiplexing (TDM). (4 marks)
- (c) Copper cables offer different throughputs in data communication. Outline **four** factors that influence the cables'. (4 marks)
- (d) With aid of a diagram, describe TCP handshake. (6 marks)
3. (a) Explain **two** types of cookies as used in the Internet. (4 marks)
- (b) Joan was requested to patch communication software in her company's computers. Explain **two** reasons that could have influenced the request. (4 marks)
- (c) Use of password expiration features in data communication systems is unpopular. Explain **two** limitations of this feature. (4 marks)
- (d) (i) Wireless networks are commonly used in business firms. Outline **four** benefits of the network. (4 marks)
- (ii) Explain **two** types of topology diagrams used in a local area network (LAN). (4 marks)
4. (a) Outline **two** limitations of CSMA/CD. (2 marks)
- (b) Figure 1 shows an Ethernet frame. Explain the functions of each of the parts labelled (i) and (ii). (4 marks)

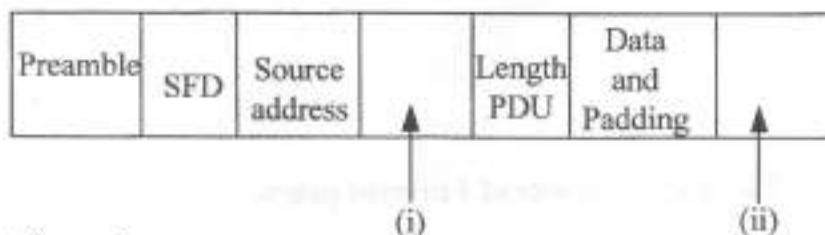


Figure 1

(c) Star topology is very popular in data communication systems. Outline **four** advantages that could justify the statement. (4 marks)

(d) (i) Describe **two** types of user interfaces in network operating systems. (4 marks)

(ii) Troubleshooting a network involves several stages. Explain **three** generic stages used by network administrators. (6 marks)

✓ 8. (a) (i) Outline any **three** layers of TCP/IP model. (3 marks)

(ii) Distinguish between *router* and *bridge* as used in networking. (4 marks)

(b) (i) Outline **three** factors, other than cost, that should be considered when selecting a fibre optic media. (3 marks)

(ii) Network administrators use several documents when troubleshooting a network. Describe **two** documents commonly used. (4 marks)

(c) Deno was required to troubleshoot a physical layer of a network for a client. Explain **three** possible symptoms that he could have realized. (6 marks)

✓ 6. (a) (i) Outline **four** parts of an email address. (4 marks)

(ii) Figure 2 shows typical tools in browser. Outline the function of each of the tools labelled (i), (ii), (iii) and (iv). (4 marks)

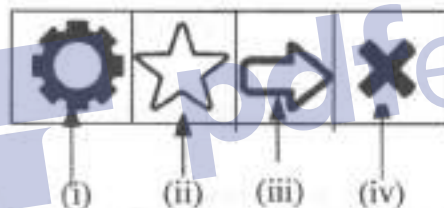


Figure 2

(b) (i) Define the term *wikis* as applied in Internet browser. (2 marks)

(ii) With aid of a diagram, outline a data communication system. (4 marks)

(c) (i) State **four** types of Internet connections used in business firms. (2 marks)

(ii) Explain **two** circumstances under which coaxial cables are most applicable in a network installation. (4 marks)

7. (a) Difference between *contention-based* and *controlled media access* methods. (4 marks)

(b) Describe **three** functions of presentation layer as used in OSI. (6 marks)

(c) IP protocol is phenomenon when configuring a network. Explain **three** of its general features. (6 marks)

(d) Most corporate prefers distributed network operating systems. Explain **two** benefits that could be influencing this trend. (4 marks)

8. (a) Explain **two** functions of network interface card in a computer. (4 marks)
- (b) (i) Outline **two** types of transmission impairments. (2 marks)
- (ii) Distinguish between *network control* and *link control* protocols as used in PPP. (4 marks)
- (c) Cloud computing is an emerging technology in business firms. Explain **two** types of clouds that could be used. (4 marks)
- (d) Explain **three** circumstances that would necessitate the implementation of frame relays in corporate networks. (6 marks)



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