

2920/301

DATA COMMUNICATION AND NETWORKING

July 2016

Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN INFORMATION COMMUNICATION TECHNOLOGY

MODULE III

DATA COMMUNICATION AND NETWORKING

3 hours

INSTRUCTIONS TO THE CANDIDATES

Answer any FIVE of the following EIGHT questions in the answer booklet provided.

ALL questions carry equal marks.

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) (i) List **three** criteria that could be used to classify data communication networks. (3 marks)
- (ii) Distinguish between a powered-over-Ethernet (*PoE*) and a non-*PoE* switch. (4 marks)
- (b) (i) Outline **three** factors that should be considered when selecting a switch, other than cost. (3 marks)
- (ii) Bottom-up troubleshooting approach could be used by network administrators to establish a network fault. Outline **four** disadvantages they are likely to realize while using this approach. (4 marks)
- (c) Implementation of any network design should follow several design principles. Describe **three** principles that should be adhered to. (6 marks)
2. (a) (i) Outline **two** categories of wireless networks. (2 marks)
- (ii) Explain the term *encapsulation* as applied to transport protocols. (2 marks)
- (b) (i) Distinguish between *blogs* and *portals* as used in the Internet. (4 marks)
- (ii) Figure 1 shows a TCP/IP termination process. Identify appropriate descriptor for each process labelled (i), (ii), (iii) and (iv). (4 marks)

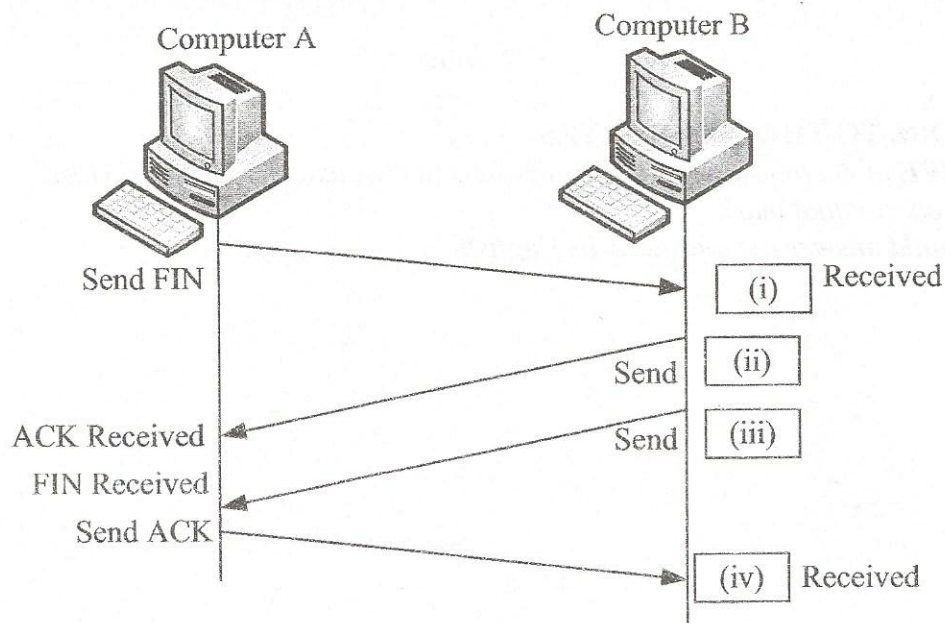


Figure 1

- (c) CFG polytechnic intends to install a wireless network that uses radio frequency for transmission. Outline **four** characteristics of the signal in the network. (4 marks)
- (d) Farasi College has introduced Internet services to its students. Explain **two** challenges that the college is likely to experience. (4 marks)
3. (a) Explain each of the following terms as used in the Internet:
 - (i) cookies; (2 marks)
 - (ii) history. (2 marks)

- (b) Network operating systems provide critical functions in data communication systems. Outline **four** typical functions that are likely to be realized. (4 marks)
- (c) Logical security measures are normally recommended approaches of preventing network insecurity incidences. Explain **two** such measures. (4 marks)
- (d) (i) Explain this **two** sub layers of the data link layer used by LAN. (4 marks)
- (ii) Every network topology requires careful considerations before installation. Outline **four** factors that should consider before the installation, other than cost. (4 marks)
4. (a) Explain **three** desirable characteristics of a web browser. (6 marks)
- (b) Network reliability is a one of the design metrics for corporate networks. Explain **two** measures that could be adopted to enhance network reliability. (4 marks)
- (c) Network intrusions are increasingly affecting business operations. Explain **two** wrong practices that could intensify these intrusions. (4 marks)
- (d) Maria intends to replace static routing protocol in her company's network. Explain **three** disadvantages of the static routing protocols that could influence her decision. (6 marks)
5. (a) (i) Outline **two** advantages of using frame relay protocol. (2 marks)
- (ii) Distinguish between *network* and *host* addresses as applied in IP addressing. (4 marks)
- (b) Shielded twisted-pair (STP) cables are commonly used in private networks. Explain **two** benefits of STP cables that could be influencing this trend. (4 marks)
- (c) With the aid of a diagram, describe the structure of a coaxial cable. (4 marks)
- (d) Data transmission uses several multiplexing techniques. Describe **three** multiplexing techniques that are likely to be used (6 marks)
6. (a) Describe **two** types of connectors used with fiber optical cables. (4 marks)
- (b) (i) Outline **two** strengths of TCP/IP protocol in data communication. (2 marks)
- (ii) Paul was required to identify ISDN channels in a job interview. Explain **two** channels that he could have mentioned. (4 marks)
- (c) Bring your own device (BYOD) poses some risks to software cooperate networks. Explain **two** potential risks that are likely to be experienced. (4 marks)
- (d) Explain **three** circumstances under which Point-to-Point Protocol (PPP) could be used on a corporate network. (6 marks)
7. (a) Distinguish between *Data Terminal Equipment* and *Data Communication Equipment*. (6 marks)
- (b) Explain **three** parts/elements of a data link layer frame. (6 marks)
- (c) UDP is a simple protocol that provides the basic transport layer functions. Explain **three** requirements for its application in a network. (6 marks)
- (d) Tom was required to install a communication software in his company's network. Explain **two** methods of installation that he could use. (4 marks)

8. (a) (i) Outline **four** minimum documentation details for troubleshooting a network. (4 marks)
- (ii) Figure 2 shows typical tool bar of a browser program. Outline the function for each of the internet zones labelled (i), (ii), (iii) and (iv). (4 marks)

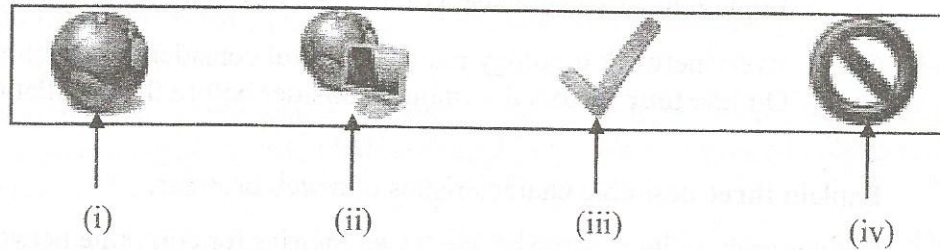


Figure 2

- (b) (i) Define the term *blind spot* as applied in data transmission. (2 marks)
- (ii) Charles intends to setup an email server for his company. Outline **four** requirements that she should consider in order to achieve her objective. (4 marks)
- (c) (i) Outline **two** functions of the application layers of OSI model. (2 marks)
- (ii) Explain **two** circumstances that could necessitate use of the file transfer protocol in data communication. (4 marks)

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