

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)

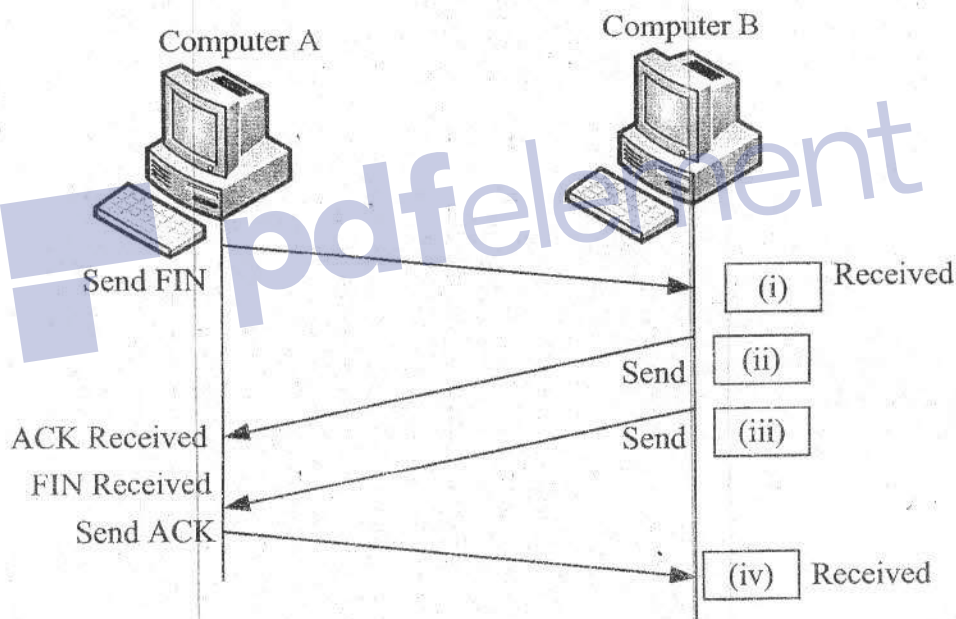


Figure 1

- (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) *url*
- (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)

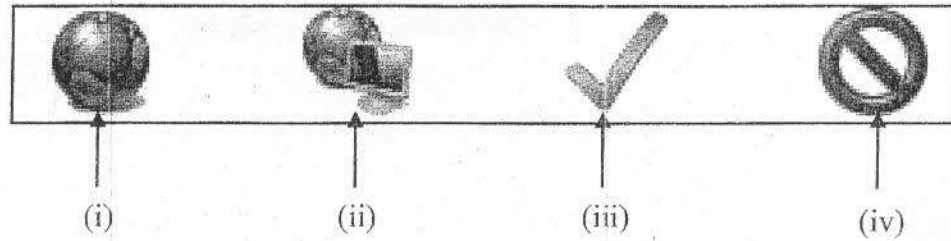


Figure 2

- (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)

THIS IS THE LAST PRINTED PAGE.