

SCAN

Name \_\_\_\_\_ Index No. \_\_\_\_\_ 1

2920/301  
DATA COMMUNICATION  
AND NETWORKING  
July 2015  
Time: 3 hours

Candidate's Signature \_\_\_\_\_

Date \_\_\_\_\_



THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN INFORMATION COMMUNICATION TECHNOLOGY

MODULE II

DATA COMMUNICATION AND NETWORKING

3 hours



**INSTRUCTIONS TO CANDIDATES**

*Write your name and index number on the question paper in the spaces provided above.  
Sign and Write the date of examination in the spaces provided above.  
Answer any FIVE of the following EIGHT questions in the spaces provided.  
Candidates should answer the questions in English.*

**For Examiner's Use Only**

Question	1	2	3	4	5	6	7	8	Total Score
Candidate's Score									

This paper consists of 12 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 **three** typical components of a data communication system. (3 marks)

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(ii) Distinguish between *ingress* and *egress* ports as applied to switches. (4 marks)

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(b) (i) Outline **three** examples of security attacks that could be exhibited on a switch. (3 marks)

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(ii) Troubleshooting takes a large portion of network administrators' time. Outline **four** guidelines that could be adopted by network administrators when carrying out troubleshooting. (4 marks)

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- (c) Vincent was preparing a presentation on a proposed hierarchical network design for a client. Explain **three** typical layers exhibited in his design that he could describe during the presentation. (6 marks)

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2. (a) (i) Outline **two** types of wireless discovery modes. (2 marks)

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- (ii) Explain the term *convergence* as applied to dynamic routing protocols. (2 marks)

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- (b) (i) Distinguish between *teleworking* and *collaboration* as used in the Internet. (4 marks)

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- (ii) Figure 1 shows a TCP/IP model. Identify each of the layers labeled A, B, C and D. (4 marks)

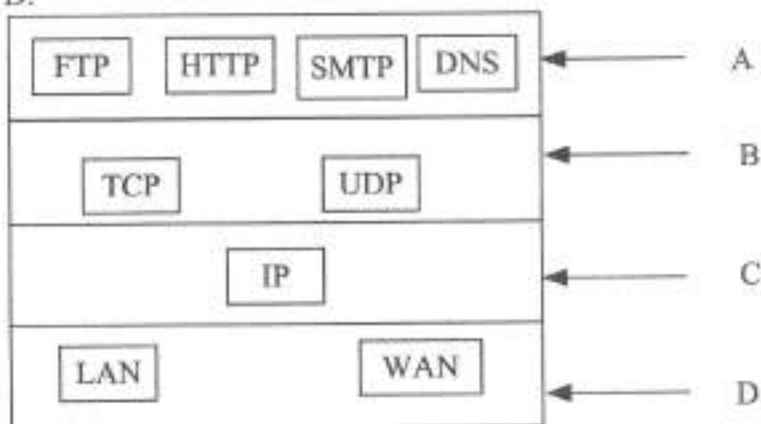


Figure 1

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- (c) Martha, a network installer was required to present a proposal to a board of management in a certain college for the installation of wireless internet for its students.

- (i) Outline **four** benefits that she could have mentioned in her proposal. (4 marks)

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- (ii) Explain **two** challenges that she could have highlighted in her proposal. (4 marks)

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

(i) index page;

(2 marks)

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(ii) hyperlink.

(2 marks)

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(b) Lois was revising her notes on network operating systems. Explain two types of network operating systems that she could have noted. (4 marks)

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(c) The ICT Manager of a certain company noted increasing physical threats in the company's network. Outline four types of the physical threats that he could have observed. (4 marks)

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(d) (i) Brenda was investigating LAN characteristics that uniquely distinguishes it from other types of networks. Outline four characteristics that she is likely to have identified. (4 marks)

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- (ii) Moses was required to identify limitations of mesh topology to a client. Outline **four** limitations he could have highlighted to the client. (4 marks)

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4. (a) Explain each of the following terms as used in browsers:

(i) plug-in; (2 marks)

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(ii) extension; (2 marks)

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(ii) autofill. (2 marks)

- (b) Assume you have been hired as a network architect, outline **four** design methods that you could consider to improve scalability in a network. (4 marks)

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- (c) Network attacks continue to be a nightmare for corporate organizations. Outline **four** effects of these attacks. (4 marks)

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- (d) Switches must be designed with efficient routing algorithm. Explain **three** functions of this algorithm in a switch. (6 marks)

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5. (a) (i) Outline **two** types of authentications that could be used in PPP protocol configuration. (2 marks)

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- (ii) Distinguish between *version* and *protocol* IP fields. (4 marks)

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- (b) A lecturer described signal transmission impairments during a DCOM lesson. Outline **four** types of impairments that he could have mentioned. (4 marks)

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- (c) Leah intends to install a LAN for a client. Outline **four** factors that she could consider to determine the appropriate bandwidth for the LAN. (4 marks)

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- (d) For each of the following network configuration cases, suggest the most appropriate type of data signaling methods:

(i) uses a series of on-off tones, lights, or clicks to send text; (2 marks)

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(ii) does not use a well defined clock rate when transmitting data signal; (2 marks)

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(iii) uses a well defined clock rate when transmitting data signal. (2 marks)

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6. (a) Describe **two** categories of fiber optical cables. (4 marks)

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- (b) (i) Outline **two** strengths of TCP/IP protocol in data communication. (2 marks)

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- (ii) Cathy, a sales lady with a certain ISP company was presenting a proposal for an ISDN connection to a potential client. Explain **two** advantages of ISDN that she could have mentioned to the client. (4 marks)

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- (c) Cloud computing is a fundamental part of modern data communication systems. Explain **two** of its benefits that could be realized by organizations. (4 marks)

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- (d) Explain **three** circumstances under which Point-to-Point Protocol (PPP) could be used on a corporate network. (6 marks)

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7. (a) With the aid of a diagram in each case, distinguish between a *half* and *full* duplex data communication systems. (4 marks)

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- (b) Explain **three** functions of data encapsulation in the MAC sub layer of the Ethernet protocol. (6 marks)

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- (c) David was required to identify circumstances that are best suited for UDP protocol in a computer network. Explain **three** types of applications that he could have identified. (6 marks)

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- (d) Babra was given a task of selecting a network operating software for her company. Outline **four** factors that she should consider other than cost. (4 marks)

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8. (a) (i) Outline **four** typical elements of a simple network management protocol (SNMP). (4 marks)

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- (ii) Figure 2 shows typical tool bar of a browser. Outline the function for each of the tools labeled (i), (ii), (iii) and (iv). (4 marks)

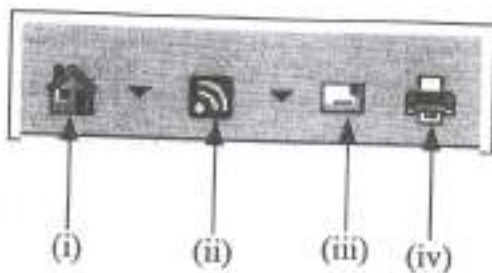


Figure 2



- (b) (i) Define the term *fault tolerance* as applied in data communication. (2 marks)

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- (ii) Judy intends to introduce emails communication in her company network. Outline **four** requirements that she should consider in order to achieve her objective. (4 marks)

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(c) (i) Outline the last **two** layers of OSI model.

(2 marks)

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(ii) Explain **two** circumstances that could necessitate an organization to install wireless network.

(4 marks)

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