

Name \_\_\_\_\_

Index No. \_\_\_\_\_ / \_\_\_\_\_

2920/301  
**DATA COMMUNICATION  
 AND NETWORKING**

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

November 2015

Date \_\_\_\_\_

Time: 3 hours



**THE KENYA NATIONAL EXAMINATIONS COUNCIL**

**DIPLOMA IN INFORMATION COMMUNICATION TECHNOLOGY**

**DATA COMMUNICATION AND NETWORKING**

**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 following **EIGHT** questions in the spaces provided in this question paper.*

***ALL** questions carry equal marks.*

***Candidates should answer the questions in English.***

#### **For Examiner's Use Only**

<b>Question</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>Total Score</b>
<b>Candidate's Score</b>									

**This paper consists of 11 printed pages.**

**Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.**



- (ii) Rose intends to install a star topology in her company's network. Outline **four** factors that she should consider before the installation, other than cost. (4 marks)

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- (d) Network administrators are support to monitor and troubleshoot a network by use of a set of network documentation. Explain **two** types of documents that they could use. (4 marks)

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2. (a) (i) Outline **two** functions of a network operating system (NOS). (2 marks)

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- (ii) Describe **two** components of a data communication system. (4 marks)

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- (b) Differentiate between bottom-up and top-down troubleshooting methods. (4 marks)

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- (c) A lecturer described the functions of TCP/IP protocol to a class. Outline **five** functions he could have mentioned. (5 marks)

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- (d) Majority of network engineers prefer to use *IP Version 6* instead of *IP version 4*. Outline **five** limitations of IP version 4 (IPV4) that could be influencing this preference. (5 marks)

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3. (a) Explain each of the following type of network design:

- (i) stub; (2 marks)

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- (ii) flat. (2 marks)

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- (b) (i) Differentiate between *packet switching* and *circuit switching* as used in data communication. (4 marks)

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- (ii) Tabitha was required to use untended installation for a certain communication program. Explain **two** disadvantages she could realize while using this method of installation. (4 marks)

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- (c) S24 Company Ltd. intends to incorporate several fault tolerance measures in its network design. Explain **two** measures that the company could consider. (4 marks)

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- (d) Frame relay is cost effective for WAN connections. Outline **four** reasons justifying this statement. (4 marks)

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- 4. (a) (i) Outline **three** benefits of ring topology in organizations. (3 marks)

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- (ii) Outline **three** types of networks based on the number of devices serviced. (3 marks)

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- (b) Explain the following security issues of data communication systems:

- (i) identity theft; (2 marks)

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- (ii) piracy. (2 marks)

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- (c) Mary was required to explain functions of a browser program in a computer during a job interview. Outline **five** functions that she could have mentioned. (5 marks)

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- (d) Felix intends to design a shortest path routing algorithm for a data communication system. Outline **five** goals that should drive the exercise. (5 marks)

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5. (a) (i) Define the term *latency* as applied in network troubleshooting. (2 marks)

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(ii) Explain **one** factor that could affect bandwidth of a transmission media. (2 marks)

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(b) Differentiate between a *hub* and a *repeater* as used in computer networks. (4 marks)

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(c) (i) East Company Ltd. intends to use power Ethernet technology for its proposed network. Outline **four** benefits that it could realize from this decision. (4 marks)

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(ii) ISDN is still widely used for WAN connectivity. Explain **two** types that could be used in organizations. (4 marks)

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- (d) Jamaa Technical College intends to install Internet hotspots in all their lecturers' rooms. Explain **two** advantages of this kind of service. (4 marks)

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6. (a) Explain each of the following data transfer modes in files transfer protocol:

(i) stream; (2 marks)

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(ii) block; (2 marks)

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(iii) compressed. (2 marks)

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- (b) Figure 1 shows a typical tool bar of an Internet program. Explain **two** physical resources that should be used with the feature labelled (i). (4 marks)

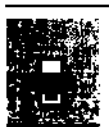


Figure 1

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- (c) Differentiate between *half duplex* and *full duplex* data communication. (4 marks)

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- (d) Assume you are consulted by an organization to recommend the measures that it could take to mitigate emerging trends in data communication. Explain **three** measures that you could recommend. (6 marks)

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8. (a) (i) List **four** categories of twisted copper wire that could be used in building networks. (2 marks)

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- (ii) Differentiate between *symmetric* and *asymmetric* encryption as applied in data security. (4 marks)

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- (b) Data security measures require consultation with all stakeholders in organization. Explain **two** logical security measures that could be incorporated in a data communication even without consultation. (4 marks)

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- (c) (i) Explain the term *access layer* as applied in network design. (2 marks)

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- (ii) TCP is considered a reliable transport protocol. Outline **four** basic operations that promote its reliability. (4 marks)

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- (d) For each of the following scenario, identify the appropriate communication software:

- (i) sharing private information with friends; (1 mark)

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- (ii) sending assignments to a lecturer; (1 mark)

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- (iii) sending short messages to a workmate; (1 mark)

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- (iv) sending monthly price catalogue to clients. (1 mark)

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