



**CICT PART II SECTION 4**

**DATA COMMUNICATION AND COMPUTER NETWORKS - PRACTICAL**

**FRIDAY: 24 May 2019.**

**Time Allowed: 3 hours.**

**Answer ALL questions. Marks allocated to each question are shown at the end of the question.**

**You are provided with the following items:**

1. One flash disk.
2. Printing materials.
3. Two standalone personal computers.
4. Three CAT 5/6 Ethernet straight through cables terminated with RJ-45.
5. One Ethernet switch.
6. A printer.

**Additional instructions:**

- (a) Save all your work (including typed answers to the theory questions where applicable) in the flash disk provided and in a folder bearing your registration number.
- (b) Work on each question should be saved in the subfolder contained in the folder created in instruction (a) above. The name of the subfolder should correspond to the question number.
- (c) Your registration number **MUST** appear as a header on every printout containing your work.
- (d) You must also indicate the number of the question answered on the header created in instruction (c) above.

**Note:** The information in instructions (a) to (d) above must be computer generated.

**At the end of the examination duration, you should hand in to the invigilator(s):**

- (i) The flash disk containing your work.
- (ii) ALL printed work.
- (iii) ALL unused printing paper(s).

Using the network resources provided, set up a LAN and configure the computers with the following settings:

	<b>Computer 1</b>	<b>Computer 2</b>
IP Address	Debo 196.162.50.10	Kafu 196.162.50.20
Subnet Mask	255.255.255.0	255.255.255.0
Default Gateway	196.162.50.10	196.162.50.10

Use the network to answer all the questions in this paper.

**QUESTION ONE**

Create a word processor document named "Question One" and use it to save your solutions to the following questions:

- (a) Use an appropriate command to display the internet protocol (IP) configuration details for Debo and Kafu computers.  
Capture in each case a screenshot showing IP configuration details of Debo and Kafu computers. (4 marks)

- (b) From Debo computer, use an appropriate command to:
- (i) Test your network connectivity and capture a screen shot showing that your two computers are communicating. (3 marks)
  - (ii) Provide information about network latency and network loss at intermediate hops between a source and destination. (3 marks)
  - (iii) Display the host(s) through which a packet would travel to Kafu computer. (2 marks)
  - (iv) Indicate the domain name associated with the IP address. (2 marks)

Capture in each case a screenshot of your results for each of the above tasks.

- (c) Explain the following terms as used in signal transmission:
- (i) Bit rate. (1 mark)
  - (ii) Rise time. (1 mark)
  - (iii) Signal-to-noise ratio. (2 marks)
- (d) Differentiate between switching and routing functions of data network communication. (2 marks)

Print "Question One" document.

**(Total: 20 marks)**

### QUESTION TWO

Create a word processor document named "Question Two" and use it to save solutions to questions (a) to (e) below:

- (a) Configure Debo and Kafu computers to a workgroup called Kabo. Capture a screenshot showing the above configuration. (3 marks)
- (b) Using Debo, create a group called Network Installers. Make this group to be a member of Network service and remote interactive log in.  
Capture an appropriate screenshot showing the Network Installers group. (4 marks)
- (c) Use an appropriate tool to show the services in (b) above and group them as running and stopped.  
Capture the resulting screenshot. (3 marks)
- (d) Use the appropriate command to display detailed network summary of Kafu computer.  
Capture a screenshot showing the above display. (4 marks)
- (e) Citing related activities, analyse three components of the internet of things (IOT) value chain. (6 marks)

Print "Question Two" document.

**(Total: 20 marks)**

### QUESTION THREE

Create a word processor document named "Question Three" and use it to save solutions to the following questions:

- (a) Identify the network and broadcast domain address for Debo and Kafu computers.  
Capture and save the screenshot displaying the above details for each computer. (2 marks)
- (b) While in Kafu computer, use appropriate commands to:
  - (i) Display routing table for active routes and network destination. (2 marks)
  - (ii) Display address resolution protocol (ARP) entries in verbose mode. (2 marks)

Capture in each case a screenshot of the above displays.

- (c) Using Debo computer, use appropriate command to:
  - (i) Create a user called "ugeni" with password 123456.  
Display a screenshot of ugeni as a user account. (2 marks)
  - (ii) Configure the security settings of the printer to only allow ugeni as a user to have access to the printer.  
Capture a screenshot showing the above configuration. (2 marks)
  
- (d) A windows system's audit policy determines the type of information about the system which is critical in decision making process or purposes.
  - (i) Capture and save screenshots displaying the way a network administrator can configure logon events if users logon successfully or fail. (2 marks)
  - (ii) Capture and save screenshots showing how one could view successful or failure logon files as a result of (d) (i) above. (2 marks)
  
- (e) In relation to the method of data conversion, describe three types of data encoding techniques. (6 marks)

Print "Question Three" document.

(Total: 20 marks)

**QUESTION FOUR**

Create a word processor document named "Question Four" and use it to save the solutions to the following questions:

- (a) Different types of printers could be managed from one computer to another using the operating system.  
**Required:**
  - (i) Using the printer migration tool, export all the printer queues, printer ports and printer drivers for Debo computer to a file named "migrate" in your flash disk.  
Capture screenshots of the procedures taken and the file in your flash disk. (4 marks)
  - (ii) From Debo computer, import the "migrate" file saved in (a) (i) above using network access.  
Capture the screenshots showing the steps used. (2 marks)
  
- (b) Local users and groups secure and manage user accounts and groups stored locally on a storage system.  
**Required:**  
Using Kafu computer:
  - (i) Display and capture "all users" list. (2 marks)
  - (ii) Display and capture the list of all group members. (2 marks)
  
- (c) A network performance test is used to quantitatively or qualitatively measure the performance of a computer network:  
**Required:**
  - (i) Capture the communication test results between Debo and Kafu computers. (2 marks)
  - (ii) Capture the network throughput graph. (2 marks)

- (d) Jaza business Ltd. is proposing installation of a computer network. The manager is however concerned with traffic issues.

**Required:**

Advise Jaza Business Ltd. on four factors to be considered relating to traffic requirements during the design of a computer network. (4 marks)

- (e) Analyse two roles of a network administrator in an organisation. (2 marks)

Print "Question Four" document.

**(Total: 20 marks)**

**QUESTION FIVE**

Create a word processor document named "Question Five". Use the document to save your answers to the following questions:

- (a) Create a folder named "Transmission mode" in Debo computer. Share the folder and view it on Kafu computer.  
Capture a screenshot showing the folder on Kafu computer. (2 marks)
- (b) Turn off your operating system firewall.  
Capture screenshots showing the procedure used. (3 marks)
- (c) Using the appropriate tools, capture and save screenshots showing procedures of viewing your LAN authentication certificate.  
Capture and save the authentication report. (3 marks)
- (d) Use the advanced internet properties of Debo computer to add the following sites to the trusted sites:  
<https://www.google.co.ke>.  
<https://www.kasneb.or.ke>.  
Capture and save screenshots showing the added sites. (3 marks)
- (e) Capture and save screenshots from Kafu computer on how to backup a system image to Debo computer. (3 marks)
- (f) Differentiate between a wireless access point (WAP) and a bridge. (4 marks)
- (g) Explain the concept of a "smart home" in relation to data communication and computer networking. (2 marks)

Print "Question Five" document.

**(Total: 20 marks)**

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