



CICT PART II SECTION 4

DATA COMMUNICATION AND COMPUTER NETWORKS - PRACTICAL

FRIDAY: 30 November 2018.

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:

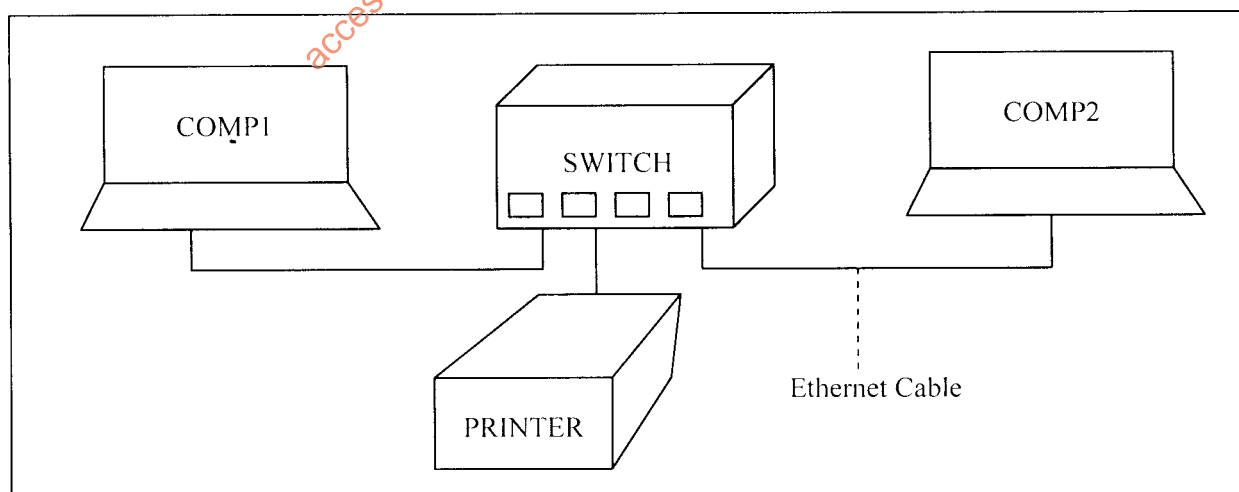
- (a) Save all your work (including typed answers to the theory questions where applicable) in the flash disk provided and in a folder bearing your registration number.
- (b) Work on each question should be saved in the subfolder contained in the folder created in instruction (a) above. The name of the 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).

Use the illustrations of the local network diagram below for all the questions in this paper.



Comp1, Comp2 refer to Computer 1 and Computer 2 respectively.

QUESTION ONE

Create a word processor document named "Question One". Use the word processor document to save solutions to questions (a) to (e) below:

- (a) Configure Comp1, Comp2 and the printer with your own TCP/IPv4 properties such that the devices will communicate to each other when connected to the switch.

Capture and save screenshots of the configuration properties of each device. (4 marks)

- (b) Connect the devices to the switch. From Comp1, use an appropriate utility to test its connectivity to:

(i) Comp2. (2 marks)

(ii) Printer. (2 marks)

Capture and save screenshots depicting the above connectivity.

- (c) From Comp2, use an appropriate utility and the loopback address to test whether the network adapter on your computer is working properly.

Capture and save a screenshot of the above results. (3 marks)

- (d) From Comp1 command prompt interface, use an appropriate tool to display the various ways in which you could configure and monitor the network interface card (NIC).

Capture and save a screenshot showing the variants of commands displayed. (3 marks)

- (e) A data communication network must meet the criteria of performance which is measured by the response time.

Analyse three factors that affect response time of a data communication network. (6 marks)

Print "Question One" document.

(Total: 20 marks)

QUESTION TWO

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

- (a) Use an appropriate utility to display the network summary information from either of the computers.

Capture and save a screenshot of the summary information. (3 marks)

- (b) From Comp2, use an appropriate tool to query the cache contents of Comp1.

Capture and save the resulting screenshot. (3 marks)

- (c) Use an appropriate networking command to display protocol statistics and current TCP/IP connections using NetBIOS over TCP/IP (NBT) from either Comp1 or Comp2.

Capture and save a screenshot showing the above information. (3 marks)

- (d) From Comp1, use an appropriate tool to display network information that could assist you troubleshoot network problems related to domain name service (DNS) and dynamic host configuration protocol (DHCP).

Capture and save the resulting screenshot. (3 marks)

- (e) On Comp2, use an appropriate utility to release the current DHCP configuration and discard the IP address.

Capture and save a screenshot of the resulting window. (2 marks)

- (f) Using an illustration in each case, describe the following data transmission modes:
- (i) Simplex. (2 marks)
 - (ii) Half duplex. (2 marks)
 - (iii) Full duplex. (2 marks)

Print "Question Two" document.

(Total: 20 marks)

QUESTION THREE

Create a word processor document named "Question Three". Use the word processor document to save your solutions to questions (a) to (e) below:

- (a) Set the users settings of Comp1 to require the users to press Ctrl+alt+delete keys for secure sign-in.
Capture and save the screenshot showing procedures taken to configure the settings. (4 marks)
- (b) (i) Using Comp2, create a homegroup network that will allow sharing of printers and documents only.
Capture and save screenshots showing the procedure followed in creating the homegroup network. (4 marks)
- (ii) Join the homegroup network created in (b) (i) above to Comp1 and display the shared files and devices of Comp2.
Capture and save a screenshot showing the shared resources. (2 marks)
- (c) Set the DVD drive in Comp2 to be accessible and usable by a user in Comp1.
Using Comp1, capture and save the screenshot displaying the steps taken and the drive access icon. (4 marks)
- (d) Complete the table below by indicating the differences between a domain and a workgroup with respect to the parameters provided:

Parameter	Domain	Workgroup
Security		
Administration		
Application		

(3 marks)

- (e) In relation to the internet of things (IoT), describe a "sensor network" (3 marks)

Print "Question Three" document.

(Total: 20 marks)

QUESTION FOUR

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

- (a) Use appropriate diagnostic tool to display the following on Comp1:
- (i) Routing table contents. (2 marks)
 - (ii) List of computers and network devices on the network. (2 marks)

Capture and save screenshots displaying the above details.

- (b) Using Comp2, capture and save screenshots displaying the performance of the following:
- (i) Output queue length for network interface. (2 marks)
 - (ii) Performance diagnostics for TCP/IP. (2 marks)
- (c) On Comp1, perform the following tasks:
- (i) Prevent potentially harmful malware from making changes to the computer. (2 marks)
 - (ii) Enable operating system to use roaming profile whenever a user logs into the computer. (2 marks)
 - (iii) Allow other network users to connect through Comp1 as a private network connection. (2 marks)
- Capture and save screenshots displaying the configurations in (i) to (iii) above.
- (d) Explain the following terminologies as used in data communication and computer networks:
- (i) Packet switching. (2 marks)
 - (ii) Routing. (2 marks)
 - (iii) Address resolution protocol (ARP). (2 marks)

Print "Question Four" document.

(Total: 20 marks)

QUESTION FIVE

Create a word processor document named "Question Five". Use the word processor document to save your solutions to questions (a) to (d) below:

- (a) On Comp2, create the following user accounts:
- Doni - Member of Administrator's group.
 - Mina - Member of Backup operators' group and Remote Desktop Users' group.
 - Vicita - Member of User group.
- Capture a screenshot showing all the users' accounts you have created. (3 marks)
- (b) (i) Allow remote desktop connections to Comp1 from computers running any version of remote desktop application.
Capture a screenshot showing the above setting. (2 marks)
- (ii) Allow user Mina to connect remotely to Comp1.
Capture screenshots showing how this task was completed. (3 marks)
- (c) Log on to Comp2 as Doni. Create a folder called Dacode18 and perform the following tasks:
- (i) Change the auditing properties of Dacode18 folder to allow user Vicita read only rights but deny the user the permission to write, delete and take ownership rights.
Capture appropriate screenshots showing how you performed the above tasks. (3 marks)
 - (ii) Make a backup plan for Comp1 on Dacode18 folder created in Comp2. Ensure that the backup is done every Saturday at 2.00 p.m.
Capture appropriate screenshots of the steps followed to complete this task. (3 marks)

(d) Explain the following terms in the context of data communication and computer networking:

- (i) Nyquist shannon theorem. (2 marks)
- (ii) Virtual LAN (VLAN). (2 marks)
- (iii) Access Control List (ACL). (2 marks)

Print "Question Five" document.

(Total: 20 marks)

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