



FINAL
Examination Paper

(COVER PAGE)

Session : April 2014

Programme : Diploma In Information And Communication Technology (DICTN/DICTI)

Course : ICT2103 / CSC2103: Network Design, Testing And Implementation

Date of Examination : July 22, 2014

Time : 5:00pm – 7:00pm Reading Time: Nil

Duration : 2 Hours

Special Instructions :

Answer any **FOUR (4)** questions.

Materials permitted : Standard Calculator

Materials provided : Nil

Examiner (s) : Mr. Victor Raj Kolintiar, Mugunthan Kandasamy.

Moderator : Associate Professor Dr. Abdullah Gani

This paper consists of 4 printed pages, including the cover page.

INTI INTERNATIONAL COLLEGE SUBANG

DIPLOMA IN INFORMATION AND COMMUNICATION TECHNOLOGY PROGRAMME
(DICTN/DICTI)ICT2103/CSC2103: NETWORK DESIGN, TESTING AND IMPLEMENTATION
FINAL EXAMINATION: APRIL 2014 SESSION

Instructions : This paper consists of **SIX (6)** questions. Answer any **FOUR (4)** questions in the answer booklet provided. All questions carry equal marks.

Question 1

- (a) Identify and discuss **FIVE (5)** typical network design business goals. (15 marks)
- (b) Assume that a packet switch has 20 users, each offering packets at a rate of 10 packets per second. The average length of packets is 128 bytes. The packet switch needs to transmit this data over a 256-Kbps WAN circuit. Calculate the average number of packets in the queue. (10 marks)

Question 2

- (a) Design a network for an Internet cafe that has 60 workstations and a firewall server, to ensure secured Internet connection for all users. The design should include the topology, transmission medium and connecting devices. (10 marks)
- (b) *Efficiency* refers to whether applications and protocols use bandwidth effectively. Explain **THREE (3)** dependencies of network efficiency. (9 marks)
- (c) List **FOUR (4)** essential responses for a good hierarchical, modular network design. (6 marks)

Question 3

- (a) You are assigned the task to subnet the Class C network address 192.168.25.0. Create subnetting, whereby you have approximately 55 nodes per subnet. Based on the given information, answer the following questions(*show your calculations steps*):
- (i) What is the number of hosts per subnet?
 - (ii) What is the number of subnets in this network?
 - (iii) What subnet mask should you use?
 - (iv) What is the block size of each subnet?

- (v) What is the address of all subnets in this network?
 - (vi) What is the address of the last node on the last subnet?
 - (vii) What is the broadcast address for this node identified in part (vi)?
- (10 marks)
- (b) State and discuss **FIVE (5)** security tradeoffs.
- (15 marks)

Question 4

- (a) Assume that a 10-Mbps Ethernet network has 200 managed devices and each device is monitored for 10 characteristics. The polling interval is every 5 seconds and that each request and response is a single 64-byte packet. Calculate a rough estimate of the traffic load for this network. Justify if the traffic load is acceptable.
- (10 marks)
- (b) Describe the following terms:
- (i) Constant bit rate (CBR)
 - (ii) Real-time variable bit rate (rt-VBR)
 - (iii) Unspecified bit rate (UBR)
 - (iv) Available bit rate (ABR)
 - (v) Guaranteed frame rate (GFR)
- (10 marks)
- (c) List **FIVE (5)** tips when testing a prototype on a production network.
- (5 marks)

Question 5

- (a) In addition to selecting technologies and devices for a WAN network design, you must also select service providers or carriers. Answer the following questions based on the selection criteria for a WAN service provider:
- (i) List **FIVE (5)** more important criteria besides cost of services.
 - (ii) State **FIVE (5)** characteristics of the provider's network.
 - (iii) Provide **FIVE (5)** support-related questions on **service-level agreement (SLA)**.
- (15 marks)
- (b) Discuss **FOUR (4)** types of tests to run against the network designed.
- (10 marks)

Question 6

- (a) Describe the steps to convert multicast IP (233.252.16.1) to destination MAC address. (10 marks)
- (b) Identify and explain **FIVE (5)** fields in the **Real-Time Transport Protocol (RTP)** packet header that specify the attributes of the data carried in the **RTP** packet. (10 marks)
- (c) Name **FIVE (5)** possible appendixes for network design document. (5 marks)

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