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.
INSTITUTION 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)?

(b) State and discuss FIVE (5) security tradeoffs.

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.

(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)

(c) List FIVE (5) tips when testing a prototype on a production network.

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).

(b) Discuss FOUR (4) types of tests to run against the network designed.
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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