

**FINAL**  
Examination Paper

(COVER PAGE)

Session : April 2016

Programme : Diploma In Information And Communication Technology (DICTN)

Course : **ICT2103: Network Design, Testing And Implementation**

Date of Examination : 23 July, 2016 (Saturday)

Time : 2:00pm – 4:00pm Reading Time : Nil

Duration : 2 Hours

**Special Instructions :**

**SECTION A:** Answer **ALL** multiple choice questions.

**SECTION B:** Answer any **THREE (3)** essay questions.

**IMPORTANT NOTE** : **THIS PAPER SHOULD NOT BE TAKEN OUT OF THE EXAMINATION HALL**

Materials permitted : Nil

Materials provided : OMR Sheets

Examiner(s) : **Asvhini Subramaniam** and Victor Raj Kolintiar

Moderator : Associate Professor Dr Abdullah Gani

*This paper consists of 7 printed pages, including the cover page*

DIPLOMA IN INFORMATION AND COMMUNICATIONS TECHNOLOGY (DICTN)  
ICT2103: NETWORK DESIGN, TESTING AND IMPLEMENTATION  
FINAL EXAMINATION: APRIL 2016 SESSION

**Section A (40 marks)**

**Instructions:** Answer ALL the 20 multiple-choice questions in the OMR sheet.

1. The amount of time between a request for some network services and a response to the request is called \_\_\_\_\_.
  - A. Response Time
  - B. Delay Variation
  - C. Bandwidth
  - D. Propagation Delay
  
2. Efficiency refers to whether applications and protocols use bandwidth effectively. Efficiency is affected by the following, **except**
  - A. frame size
  - B. protocol interaction
  - C. interval
  - D. windowing and flow control
  
3. \_\_\_\_\_ is defined as the quantity of error-free data that is transmitted per unit of time. \_\_\_\_\_ means the data carrying capacity of a circuit and it is usually specified in bits per second.
  - A. Bandwidth; Throughput
  - B. Throughput; Bandwidth
  - C. Throughput; Goodput
  - D. Goodput; Throughput
  
4. A \_\_\_\_\_ attack provides information about potential targets and their weaknesses and is usually carried out in preparation for a more focused attack against a particular target.
  - A. Insider
  - B. Denial-of-Service
  - C. Reconnaissance
  - D. Distributed
  
5. \_\_\_\_\_ refers to the ease of use with which network users can access the network and services. Whereas \_\_\_\_\_ focuses on making network managers' jobs easier, usability focuses on making network users' jobs easier.
  - A. Affordability; manageability
  - B. Adaptability; usability
  - C. Manageability; usability
  - D. Usability; manageability

6. A radio frequency signal traveling through objects of various sorts can be affected by many different problems, including the following, **except**:
- A. Reflection
  - B. Adaption
  - C. Refraction
  - D. Diffraction
7. A typical mean time between failure (MTBF) goal for a network that is highly relied upon is 4000 hours. The network failure should be fixed within \_\_\_\_\_ hour(s).
- A. one
  - B. two
  - C. three
  - D. four
8. To maintain interconnectivity even when one or more links are down, redundant network designs include a \_\_\_\_\_ for packets to travel when there are problems on the primary path.
- A. load balancing
  - B. backup paths
  - C. Bandwidth utilization
  - D. Routing protocol
9. During topology design phase, you identify the following, **except**
- A. networks and interconnection points
  - B. the size and scope of networks
  - C. types of internetworking devices that will be required
  - D. the actual devices
10. A \_\_\_\_\_ is a connection between devices in the same layer; can be an extra router, bridge, or switch added to connect two networks. It should be avoided because they cause unexpected routing and switching problems and make network documentation and troubleshooting more difficult.
- A. open port
  - B. hidden door
  - C. loop hole
  - D. backdoor

11. The formula to calculate Availability (A) is:
- A. MTBF-MTTR
  - B. MTBF+MTTR
  - C.  $(MTBF + MTTR) / MTBF$
  - D. None of the above
12. What is the default subnet mask for Class B IP address?
- A. 255.0.0.0
  - B. 255.255.0.0
  - C. 255.255.255.0
  - D. 127.0.0.1
13. \_\_\_\_\_ IP address is used for IP multicast.
- A. Class E
  - B. Class D
  - C. Class A
  - D. Class B
14. Topology design should feature the following **except**
- A. hierarchy
  - B. modularity
  - C. complicity
  - D. security
15. Which of the following is **not** the network design business goal?
- A. Increase revenue and profit
  - B. Improve corporate communications
  - C. Build partnerships with companies
  - D. Increase network security controls
16. A \_\_\_\_\_ is an emulation of a standard LAN that allows data transfer to take place without the traditional physical constraints placed on a network.
- A. VLAN
  - B. VPN
  - C. Private LAN
  - D. None of the above

17. Which class of IP address provides a maximum of only 254 host addresses per network ID?
- A. Class A
  - B. Class B
  - C. Class C
  - D. Class D
18. You want to implement a mechanism that automates the IP configuration, including the IP address, subnet mask, default gateway, and DNS information. Which protocol will you use to accomplish this?
- A. SMTP
  - B. SNMP
  - C. DHCP
  - D. ARP
19. Which of the following contention mechanism is used by Ethernet?
- A. Token passing
  - B. CSMA/CD
  - C. CSMA/CA
  - D. Host polling
20. Which of the following is private IP address?
- A. 12.0.0.1
  - B. 168.172.19.39
  - C. 172.15.14.36
  - D. 192.168.24.43

**Section B (60 marks)**

Answer any **THREE (3)** out of **FOUR (4)** questions in the answer booklet provided. All questions carry equal marks.

**Question 1**

- (a) Identify and explain **FOUR (4)** major phases of network design. (8 marks)
- (b) A packet switch has 6 users, each offering packets at a rate of 9 packets per second. The average length of the packets is 1024 bits. The packet switch needs to transmit this data over a 64-Kbps WAN circuit. Calculate the **queue depth** (average number of packets in the queue). (6 marks)

- (c) Discuss **THREE (3)** methods to check the health of the existing internetwork. (6 marks)

### Question 2

- (a) Explain the **FOUR (4)** types of traffic flow. (8 marks)
- (b) Discuss the **FOUR (4)** options of multihoming the Internet connection. (8 marks)
- (c) List any **FOUR (4)** technical goals for network design. (4 marks)

### Question 3

- (a) You are assigned the task to subnet the Class C network address 192.168.55.0. Do subnetting, whereby you have approximately 25 nodes per subnet. Based on the given information, answer the following questions:
- (i) What is the number of subnets in this network?
  - (ii) What is the block size of each subnet?
  - (iii) What subnet mask should you use?
  - (iv) What is the address for the last subnet?
  - (v) What is the address of the last node on the last subnet?
  - (vi) What address would this node identified in part (v), use to send to all devices on its subnet?
- (6 marks)
- (b) Compare the selection criteria between Distance Vector and Link State algorithms and name **ONE (1)** routing protocol that use each algorithm. (8 marks)
- (c) List the **TWELVE (12)** step program for the network security design. (6 marks)

### Question 4

- (a) Design a network for a company that has 20 workstations and 2 servers with a leased line Internet connection. The design should include the network map, transmission medium and connecting devices. (5 marks)
- (b) Explain **FIVE (5)** selection criteria for internetworking devices. (10 marks)

- (c) Define the following IEEE 802.3 Ethernet technologies:
- (i) 10Base5
  - (ii) 10BaseF
  - (iii) 100BaseT4
  - (iv) 1000BaseSX
  - (v) 10GBaseE

(5 marks)

**~THE END~**  
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