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**University Examinations 2014/2015**

SECOND YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY

AND

SECOND YEAR SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF BUSINESS INFORMATION TECHNOLOGY

**CIT 3226: NETWORK SYSTEMS DESIGN AND MANAGEMENT**

 **DATE: APRIL 2015 TIME: 2 HOURS**

**INSTRUCTIONS:** *Answer question* ***one*** *and any other* ***two*** *questions*

**QUESTION ONE (30 MARKS)**

1. Discuss the features of each of the two main user interface types (4 Marks)
2. Discuss how the SMART metaphor is used to assess the quality of a network system

(4 Marks)

1. Discuss the following IEEE stipulations for a LAN (4 Marks)
2. Error rates
3. Data rates
4. Geographical area
5. Ownership
6. Distinguish between the following terms and give examples:
7. Full duplex verses half duplex (2 Marks)
8. IP addressing verses NAT (2 Marks)
9. Link local verses DHCP (2 Marks)
10. With the use of well labeled diagrams differentiate between a logical topology verses a physical topology (4 Marks)
11. Explain the limitations and benefits of the following network design choices
12. Peer-to-peer versus client server (4 Marks)
13. SOHO verses SMB (4 Marks)

**QUESTION TWO (20 MARKS)**

1. Discuss four cable specification features used to describe transmission media for the Ethernet standard (4 Marks)
2. Explain the following network performance indicators:
3. Network Traffic (2 Marks)
4. Network Scalability (2 Marks)
5. Network Availability (2 Marks)
6. Bandwidth Utilization (2 Marks)
7. Network Security (2 Marks)
8. With suitable examples, explain the all-important “political layer” when implementing a networking project (3 Marks)
9. “There are two kinds of people in this world; those who know binary and those who do not”. Decipher this analogy with reference to network systems (3 Marks)

 **QUESTION THREE (20 MARKS)**

1. Identify the MS-DOS commands required to troubleshoot the following situations:
2. Testing the connectivity between two nodes (2 Marks)
3. Tracing the route through which a data packet shall be transmitted (2 Marks)
4. Releasing an IP address (2 Marks)
5. Knowing the IP address given the domain name (2 Marks)
6. Complete the IP address table below:

|  |  |  |  |
| --- | --- | --- | --- |
| Class  | First Octate Value | Host bits | Network bits |
| A |  |  |  |
| B |  |  |  |
| C |  |  |  |
| D |  |  |  |
| E |  |  |  |

c) With a well labeled diagram, explain the limitations and benefits of the three main network topologies (6 Marks)

d) Convert the following decimal values into binary notations:

1. 192.168.0.10 (1 Mark)
2. 255.255.255.0 (1 Mark)

**QUESTION FOUR (20 MARKS)**

1. As a network implementer, how would you remedy the following problems:
2. RFI and EMI (2 Marks)
3. Noise in a signal (2 Marks)
4. Attenuation (2 Marks)
5. At the MS-DOS command prompt, which commands would one use to troubleshoot the following problems:
6. How to identify a device’s IP address (2 Marks)
7. Verify the connectivity between two nodes (2 Marks)
8. Get the public IP address of the network you are in, given the domain name

 (2 Marks)

1. Discuss the key concerns of a network designer who adopts the top-down approach in each of the following layers
2. Layer seven (2 Marks)
3. Layer six (2 Marks)
4. Layer five (2 Marks)
5. Explain the distinction between the top-down verses the bottom up approach network design (2 Marks)

**QUESTION FIVE (20 MARKS)**

1. Differentiate between the SDLC and Priscilla Oppernheimer’s approach to designing network systems (4 Marks)
2. Illustrate and explain the components required for setting up the following network designs:
3. A flat design (3 Marks)
4. A hierarchical design (3 Marks)
5. Calculate how long it would take to download a file of 50 MB in size over the following cable specifications:
6. 10 BASE-T (2 Marks)
7. 10 BASE-2 (2 Marks)
8. 100 BASE-5 (2 Marks)
9. Use a diagram to demonstrate the recommended choice between a 2-tiered network model from a 3-teired network model (4 Marks)