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**University Examinations 2015/2016**

SECOND YEAR, FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN COMPUTER SCIENCE, BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY, BACHELOR OF SCIENCE IN COMPUTER SECURITY AND FORENSICS AND BACHELOR OF SCIENCE IN COMPUTER TECHNOLOGY, BACHELOR OF PURCHASING AND SUPPLIES MANAGEMENT

**CIC 3202: NETWORK SYSTEMS DESIGN AND IMPLEMENTATION**

**DATE: NOVEMBER 2015 TIME: 2 HOURS**

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

**QUESTION ONE (30 MARKS)**

1. Discuss Priscilla Oppenheimer’s Approach to capturing a network design requirements (4 Marks)
2. Describe the role of network topologies within a network design (4 Mark)
3. Explain the basic networking hardware required to interconnect two PCs (4 Marks)
4. Distinguish between the following terms and give examples:
5. Network OS verses PC OS (2 Marks)
6. Network configuration verses Network customization (2 Marks)
7. Network design verses Network implementation (2 Marks)
8. With the use of well labelled diagrams differentiate the main networking topologies used in network systems ` (4 Marks)
9. Identify the networking devices required in the following situations and give reasons for your choice of device:
10. Creating a subnet mask (2 Marks)
11. Directing packet traffic between public and private IPs (2 Marks)
12. Network address translation (2 Marks)
13. Limiting internet use during working hours (2 Marks)

**QUESTION TWO (20 MARKS)**

1. The IP protocol is a routable protocol. Explain what is a routable protocol (4 Marks)
2. Discuss the network performance indicators in the following scenarios:
3. The decision to use CAT5e or CAT6 (2 Marks)
4. Surfing the internet at night or during the day (2 Marks)
5. Quick or slow response between two chat sessions (2 Marks)
6. Fluctuation is download speed (2 Marks)
7. Packet loss (2 Marks)
8. Describe situations would you recommend the following type of network designs:
9. A flat design (3 Marks)
10. A hierarchical design (3 Marks)

 **QUESTION THREE (20 MARKS)**

1. Explain the networking solution required for interconnecting a UNIX machine and a Windows machine for data transfer (4 Marks)
2. Computer networks are managed via servers. List and explain any four types of servers. (4 Marks)
3. Discuss the role played by the following:
4. Gateway (3 Marks)
5. Bridge (3 Marks)
6. VPNs (3 Marks)
7. Tunnelling (3 Marks)

 **QUESTION FOUR (20 MARKS)**

1. Explain the use of the OSl reference model by network administrator while trouble shooting a network system (6 Marks)
2. The data link layer in the IEEE standard is divided into two sublayers: LLC and MAC. Indicate the functions performed by each sublayer. (2 Marks)
3. Serial transmission mechanisms are divided depending on how they are spaced in time. Discuss **three** categories of serial transmission giving examples (6 Marks)
4. Describe the features of the following cable specifications:
5. 10 BASE-T (2 Marks)
6. 10 BASE-2 (2 Marks)
7. 100 BASE-5 (2 Marks)
8. Use a diagram to distinguish between a hierarchical network design from a flat network design. (4 Marks)

**QUESTION FIVE (20 MARKS)**

1. Discuss any **four** fundamental design goals of a network (8 Marks)
2. Explain any **five** network design requirements (10 Marks)
3. Explain any **two** advantages of networking (2 Marks)