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**University Examinations 2015/2016**

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

**CIT 3152: DATA COMMUNICATIONS AND NETWORKS**

 **DATE: AUGUST 2016 TIME: 2HOURS**

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

**QUESTION ONE (30 MARKS)**

1. As a network administrator, you want to connect two building within your organization. What are the design factors you are going to consider before selecting a transmission medium that you will use? (4 Marks)
2. Discuss any three unguided media and any two guided media. (10 Marks)
3. Describe full-duplex and half-duplex communication. (3 Marks)
4. Give three examples of usages for straight-through cables. (3 Marks)
5. Serial transmission mechanisms can be divided into three broad categories (depending on how transmissions are spaced in time). Discuss (6 Marks)
6. Discuss the need for OSI model in data communication. (4 Marks)

**QUESTION TWO (20 MARKS)**

1. With the help of a diagram discuss the following topologies:
2. Bus
3. Star
4. Mesh (6 Marks)
5. Give two reasons why you would prefer star topology over bus topology. (4 Marks)
6. Differentiate between pc and network operating systems. (6 Marks)
7. Discuss any two problems with microwave transmission. (4 Marks)

**QUESTION THREE (20 MARKS)**

1. Discuss the main features to consider when selecting Network Operating Systems. (5 Marks)
2. Discuss the following concepts highlighting pros and cons of each:
3. Peer to peer
4. Client server (10 Marks)
5. Discuss the concept of parallel transmission. (3 Marks)
6. Discuss any two advantages of parallel transmission. (2 Marks)

**QUESTION FOUR (20 MARKS)**

1. Discuss any three types of servers. (6 Marks)
2. Discuss the following terms as used in data communication:
3. Baud rate
4. Bits per second
5. Bandwidth (6 Marks)
6. Discuss any four reasons why computers are networked. (8 Marks)

**QUESTION FIVE (20 MARKS)**

Consider the network topology shown below. The topology consists of multiple routers interconnected by links. Each link has a static cost associated with it which represents the cost of sending data over that link.

Please use Dijikstra’s shortest-path algorithm to compute the shortest path from y to all network nodes. Show your work by computing a table similar to tables below. Please briefly describe the sameness and differences between switches and routers. (20 Marks)