STIJ 3053

FINAL EXAM
FIRST SEMESTER SESSION 2011/2012

COURSE CODE / NAME : STIJ 3053 NETWORK DESIGN
DATE : 13 JANUARY 2012 (FRIDAY)
TIME : 9:00 AM – 11:30 AM (2 1/2 HOURS)
VENUE : DMS

INSTRUCTION :

1. This question booklet contains FOURTEEN (14) questions in NINE (9) printed pages excluding the cover page.
2. Answer ALL questions.
3. You are NOT ALLOWED to remove the exam paper from the examination hall.

MATRIC NO : _________________________________
( with word )

IDENTIFICATION CARD NO : _________________________________

LECTURER : ____________________________________________

GROUP : ____________ TABLE NO : ____________

DO NOT OPEN THIS EXAMINATION PAPER UNTIL INSTRUCTED

CONFIDENTIAL
ANSWER ALL THE QUESTIONS

1. Explain briefly TWO (2) broad categories of communication networks. (6 marks)

2. The OSI reference model and TCP/IP reference model are two important network architectures.

   a) State all the layers for OSI reference model and TCP/IP reference model. (4 marks)
b) Discuss the comparison between the two reference models. (3 marks)

3. Local Area Networks, or LAN, are privately-owned networks within a single building or campus of up to a few kilometers in size.

a) What is the most widely used LAN standard? Explain the standard briefly. (4 marks)

b) Explain why high speed LANs are needed nowadays. (4 marks)
4. Internetworking can be extremely complex because generally it involves connecting networks that use different protocols.

a) Explain the function of the internetworking devices below:
   a. Repeaters
   b. Bridges
   c. Routers
   d. Brouters
   e. Hubs
   f. Gateways

   (6 marks)

b) If you are going to interconnect TCP/IP network with SNA network, what is the suitable device to be used? Justify your answer.

   (4 marks)
5. Fiber Distributed Data Interface (FDDI) is a reliable and high-speed transmission medium for mission critical and high traffic networks.

a) List down FIVE (5) advantages of using FDDI. (5 marks)

b) In contrast to FDDI, Integrated Services Digital Network (ISDN) can transmit data, voice and video over existing copper phone lines. In terms of real implementation, in your opinion, why ISDN is no more popular nowadays. (4 marks)
6. Explain briefly all the phases of Plan Design Implement Operate Optimize (PDIOO) network lifecycle. (6 marks)

7. Give **EIGHT** (8) technical goals for top-down network design approach. Explain briefly how they can be used to help the customer to get their intended network design. (10 marks)
8. a) Discuss why logical network design is important to network design. (3 marks)

b) Draw a network diagram to show an example of logical network for a department that is connected to the Internet. Your diagram should include Ethernet bus, THREE (3) department personal computer, a printer, a server and a firewall. Indicate the IP address of all the devices. (7 marks)
9. Why is it important to test the design of the network? State and discuss five areas to look at in the test phase.

(6 marks)

10. Performance analysis is very important in network design to ensure the network can perform at the optimum level. State and discuss five concepts which are associated with TCP/IP network performance.

(6 marks)

11. Network measurement has several subtasks. Explain the four subtasks.

(5 marks)
12. Network Simulator 2 (ns-2) is a powerful network tool to analyze the performance of the network. Explain how ns-2 can be implemented to do the job. (5 marks)

13. Give the advantages and disadvantages of WiMAX. (6 marks)
14. Wi-Fi is becoming very popular nowadays. Its performance is affected by a variety of factors, such as the distance between nodes, obstacles that obstruct direct line-of-sight, and other wireless traffic in the general area. Before we setup the a Wi-Fi network, how to verify that the setting can give the optimum network performance.

(6 marks)