COURSE CODE / NAME : STIJ 3053 NETWORK DESIGN  
DATE : 20 JUNE 2012 (WEDNESDAY)  
TIME : 9:00 AM – 11:30 AM (2½ HOURS)  
VENUE : DSB K.MAS

INSTRUCTION :

1. This question booklet contains FOURTEEN (14) questions in TWELVE (12) 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 )  
( with number )

IDENTIFICATION CARD NO. :  

LECTURER : ________________________________

GROUP : ________  
TABLE NO. : ________

DO NOT OPEN THIS EXAMINATION PAPER UNTIL INSTRUCTED

CONFIDENTIAL
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 in question 2(b). (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 briefly the function of the internetworking devices below:
   a. Repeater
   b. Bridge
   c. Router
   d. Hubs
   e. Gateways

   (5 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.

   (5 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.
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. Discuss why logical network design is important to network design. (3 marks)

9. Why is it important to test the design of the network? State and discuss FIVE(5) areas to look at in the test phase. (6 marks)
STIJ3053 Network Design

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

(6 marks)
11. Network measurement has several subtasks. Explain the **FOUR (4)** subtasks.  

(4 marks)

12. Network Simulator 2 (ns-2) is a powerful network tool to analyze the performance of the network. Explain how the ns-2 performs the **FOUR (4)** subtasks in question 11.  

(5 marks)
13. Give the advantages and disadvantages of WiMAX. (6 marks)
14. A colleague has four (4) schools with around 2000 students, 180 academic staff and 20 administrative staff. The college occupies 5-story building and has one small branch office in downtown as marketing office. The college plans to set up their computer network. The computer system of the college need to have web-based applications, email servers, and other learning management systems which can be accessed both by mobile device and conventional devices such as PC. The college also needs to connect to the Internet and the ISP gave them 6 global IP addresses. As a network consultant you are to design their network and must come out with a proposal that consists of:

i. Topological design of the network
ii. List of equipment needed
iii. IP provisioning scheme

(14 marks)