



KENYATTA UNIVERSITY
UNIVERSITY EXAMINATIONS 2010/2011
FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF
SCIENCE
SCT 303: COMPUTER NETWORK

DATE: WEDNESDAY 1ST DECEMBER 2010 **TIME: 8.00 A.M -10.00 A.M**

INSTRUCTIONS: Attempt Question ONE and any other TWO Questions

QUESTION ONE

- a. Describe the term computer network (1 mark)
- b. Explain three requirements for a computer network (3marks)
- c. Differentiate between a domain and a work group network configuration (2marks)
- d. Describe the following network terms:
 - i. TCP/IP (1mark)
 - ii. Mac address (2marks)
 - iii. DNS (1mark)
 - iv. Packet (1 mark)
 - v. Broadcast (2marks)
 - vi. Token (2marks)
 - vii. DHCP (1mark)
- e. Discuss why redundancy is used in a network, and explain how it is achieved (3marks)
- f. Give a description of the following network data transmission methods, giving one example for an area where each is used:
 - i. Token (2marks)
 - ii. Frame (1mark)
 - iii. Simplex (2marks)
 - iv. Multicast (2marks)
 - v. Half duplex (2marks)
 - vi. Full duplex (2marks)

QUESTION TWO

- a. List and explain functions of each layer of the OSI layer model, mentioning at least two protocols that are associated with each layer (7 marks)
- b. Explain three benefits that an OSI layer model provided in a computer network (3marks)
- c. With an aid of a well labeled diagram, explain the relation between the TCP/IP and OSI layer models (4marks)
- d. Give a brief description of the functions each layer of TCP/IP layer model, stating at least two protocols associated with each layer (4marks)
- e. Explain how protocols perform error detection (2 marks)

QUESTION THREE

John has developed two software systems (system1 and system2). System1 is to be deployed in a large organization with 500 users with different network access permissions. In one year, it is projected that the users will be about 800. System2 will be deployed in a car parking lot with three computers that are used by the attendants.

Explain the following:

- i. What network implementations model are suitable for system1 and system2 respectively (2marks)
- ii. Using a well labeled diagram, explain how each of the two networks are configured, and how they function (6marks)
- iii. List and discuss two advantages and two disadvantages of each of these types of networks (4marks)
- iv. Give a description of **ANY FOUR** of the following data link layer protocols:
 - SDLC (Synchronous Data Link Protocol)
 - HDLC (High-level Data Link Control)
 - PPP (Point-to-Point Protocol)
 - Frame Relay
 - LAP (Link Access Procedure)
 - SLIP (Serial Line Interface Protocol)(8marks)

QUESTION FOUR

- a. Describe the term connection- oriented protocol and give an example and where it is applied (3marks)
- b. Discuss the term network throughput (2marks)
- c. In a computer network, the technician realized that three computers could not communicate with the server. Explain four possible causes of this problem, and the possible solutions of solving each of these problems. (8marks)
- d. Ali is the network engineer in a college. He is required to network 5 computers in a workgroup. Using a well- labeled diagram, explain and illustrate how this can be achieved (7marks)

QUESTION FIVE

- a. A firewall is a popular security feature in a network. Explain how it provides access control in a network. (3 marks)
- b. Using a well labeled diagram, describe the following media:
 - i. UTP cable (2marks)
 - ii. STP cable (2marks)
 - iii. Optical fiber cable (2marks)
 - iv. Coaxial cable (2 marks)
- c. Discuss the process of token passing as a network data communication method, and mention two advantages of using a token passing over Ethernet. (4marks)
- d. With an aid of a well-labeled diagram, describe the FDDI, and list its two main advantages over token passing (5marks)