



KENYATTA UNIVERSITY
UNIVERSITY EXAMINATIONS 2011/2012
SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR
SCIENCE IN INFORMATION TECHNOLOGY

SIT 306: DATA COMMUNICATIONS AND NETWORKING

DATE: Wednesday 4th April, 2012

TIME: 2.00 p.m. – 4.00 p.m.

INSTRUCTIONS

ANSWER QUESTION ONE AND ANY OTHER TWO

QUESTION ONE **Total 30 marks**

- a. Define the term “computer network”. (2marks)
- b. Differentiate between TCP and UDP protocols (2 marks)
- c. Explain why a switch is preferred instead of a hub in connecting devices in a computer network (3 marks)
- d. Describe the following computer network terms:
 - i. Encryption (3marks)
 - ii. Mac address (2marks)
 - iii. Electromagnetic interferences (2 marks)
 - iv. Dynamic Host Configuration Protocol (DHCP) (3marks)
 - v. IP address (2 marks)
 - vi. Subnet mask (2 marks)
 - vii. Variable Length Subnet Mask (3 marks)
- d) Differentiate between CAT 5 and CAT 6 UTP cables (4 marks)
- e) Explain the need for a computer network data backup (2 marks)

QUESTION TWO**Total 20 marks**

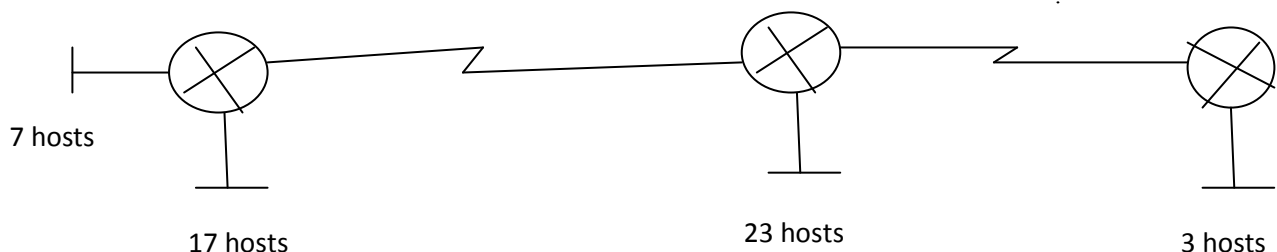
- a) Explain the difference between a client-server and a peer-peer network using well-labeled diagrams (6 marks)
- b) Explain two advantages and two disadvantages of each of these types of computer network configurations (4 marks)
- c) Explain how a Network Address Translator (NAT) is used to secure a local area network (4 marks)
- d) Assume you are configuring a LAN for a company and connect it to the Internet using a NAT. Show the packet header at the **Ethernet** and **the Serial** interfaces of the company's router. (6 marks)

QUESTION THREE**Total 20 marks**

- a) A company was assigned IP address 193.4.4.0/24. It has 15 departments that require a subnet each. While subnetting the given IP address, how many bits would you borrow? Justify your answer (3 marks)
- b) Calculate the number of hosts per subnet (4 marks)
- c) List the first five subnets (5 marks)
- d) Explain the term 'optical fiber mode' (2 marks)
- e) List and describe the two types of optical fiber modes (6 marks)

QUESTION FOUR**Total 20 marks**

- a) Given IP address 200.3.3.0/24, assign the subnet mask for each LAN and the WAN links in the figure below. (8 marks)



- b) Explain the functionalities of a Redundant Array of Independent Disks (3 marks)
- c) Using well labeled diagrams, explain the difference between RAID 0, RAID 1, RAID 5 and RAID 10. (9 marks)

QUESTION FIVE **Total 20 marks**

- a) Assume you are troubleshooting a computer network ,list and explain three system tools utilizes that you can use in this exercise (6 marks)
- b) List and explain any three security threats and how it occurs (6 marks)
- c) Which security strategies can be used to overcome the security threats you have discussed in (b) above (3 marks)
- d) Differentiate between the link state and distance vector routing protocols (4 marks)
- e) Differentiate between private and public addresses (1 mark)

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