KIRIRI WOMEN'S UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATION, 2024/2025 ACADEMIC YEAR
SECOND YEAR, SECOND SEMESTER EXAMINATION
FOR THE BACHELOR OF BUSINESS AND INFORMATION TECHNOLOGY
KBI 2209 – ARCHITECTURES OF COMPUTER NETWORKS

Date: 09TH December 2024
Time: 2:30PM – 4:30PM

INSTRUCTIONS TO CANDIDATES
ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS
QUESTION ONE (30 MARKS)

a) Describe the functionalities of the following networking devices
    i)   Firewall   (1 Mark)
    ii)   Router   (1 Mark)
    iii)   Intrusion detection system   (2 Marks)

b) Explain four major differences between TCP and UDP protocols   (4 Marks)
c) Describe two major techniques of assigning IP addresses to any networking device and outline two advantages of each technique   (4 Marks)
d) As a network administrator, you have been tasked to assign IP addresses to computers. Explain the following terms as used when assigning IP address
    i)   Subnet mask   (3 Marks)
    ii)   Default gateway   (3 Marks)
    iii)   DNS server   (3 Marks)
    iv)   DHCP server   (3 Marks)

e) Your friend, connected her laptop on the KWUST network, but her PC was not connecting to internet, upon checking IP address, you found 69.254.0.1, what is the name of the IP address, what was the cause and how can you solve the issue and pc get internet connection back
    (4 Marks)
f) Describe four major techniques of securing wireless network   (4 Marks)

QUESTION TWO (20 MARKS)

a) There are two known network cable crimping standards namely T568A and T568B. Outline T568B color code in order   (8 Marks)
b) Describe the functionalities of the following tools using cabling
    i)   Crimping tool   (2 Marks)
    ii)   Punch down tool   (2 Marks)
    iii)   LAN Cable tester   (2 Marks)
c) You have invited XYZ internet service provider to offer you network/internet services, they connected you're your router using fiber optic cable, describe the advantages fiber optic in data transmission   (6 Marks)

QUESTION THREE (20 MARKS)

a)   You have been hired by KWUST as a network administrator, you have been assigned to do subnetting using the following details

        IP Address: 192.168.1.0/24

        Number of networks: 8

        Task

    i)   Find the first 5 ranges of a network   (4 Marks)
    ii)   Calculate the valid number host per network   (3 Marks)
    iii)   Calculate maximum number of networks   (3 Marks)
    iv)   Explain the reasons why we don't assign the first and the last IP addresses per network

        (2 Marks)

b)   Differentiate between the following networking protocols and terms
    i)   SSH and Telnet   (2 Marks)
    ii)   Http and Https   (2 Marks)
    iii)   Peer to peer and server client   (2 Marks)

QUESTION FOUR (20 MARKS)

a)   As a network administrator, your role is to ensure the network is secure, Describe the following types of network attacks and their mitigations
    i)   Man in the middle attack   (3 Marks)
    ii)   Denial of service   (3 Marks)
    iii)   SQL injection   (3 Marks)
    iv)   Ransomware   (3 Marks)
    v)   Malware   (3 Marks)

b)   Describe 5 mechanisms of ensure your wireless network (Wi-Fi) is secure against unauthorized access   (5 Marks)

QUESTION FIVE (20 MARKS)

a)   You have been hired by Equity Bank as a senior network administrator, you have been assigned to do subnetting using the following details

        IP Address: 192.168.3.0/24

        Number of Host per network: 30

        Task

    i)   Find the first six ranges of a network   (4 Marks)
    ii)   Calculate maximum number of networks   (3 Marks)

b)   Briefly explain the following network troubleshooting commands
    i)   ipconfig   (2 Marks)
    ii)   ipconfig/release   (2 Marks)
    iii)   ipconfig/renew   (2 Marks)
    iv)   ping   (2 Marks)
    v)   netstat   (2 Marks)

c)   What is virtualization technology and why virtualization is widely used in most of datacenters

        (3 Marks)