(Knowledge for Development)

KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS
2020/2021 ACADEMIC YEAR

END OF SEMESTER EXAMINATIONS
YEAR FOUR SEMESTER ONE EXAMINATIONS

FOR THE DEGREE OF
BACHELOR OF COMPUTER SCIENCE

COURSE CODE :   **CSC 470E**

COURSE TITLE :   **NETWORK PROTOCOLS & STANDARDS**

DATE: 14/06/2021   TIME: 02:00 P.M – 04:00 P.M

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTIONS ONE AND ANY OTHER TWO

QUESTION ONE [COMPULSORY] [30 MARKS]

a) Define the following terms as used in internetworking

    i.   Network address   **[1 mark]**

    ii.   Broadcast address   **[1 mark]**

    iii.   Public IP Addresses   **[1 mark]**

    iv.   Private IP Addresses   **[1 mark]**

b) As a network Engineer of a reputable firm, the network experiences severe downtime rates. You are required to troubleshoot this network to identify the possible faults. Identify some possible causes of LAN traffic congestion.   **[4 marks]**

c) Differentiate between the following terms as used in computer networks.

    i.   Bridging and Routing   **[2 marks]**

    ii.   Static Routing and Dynamic Routing   **[2 marks]**

d) What is the importance of administrative distance (AD) in a network?   **[3 marks]**

e) Multiplexing is method by which multiple analog or digital signals are combined into one signal over a shared medium. Discuss the Three (3) types of multiplexing. **[3 marks]**

f) Discuss the importance of bridges as used in internetworking.   **[2 marks]**

g) Kibabii University network administrator has chosen a possible subnet mask for his\her network and need to determine the number of subnets, number of valid hosts per subnet, valid subnets, broadcast address of each subnet, and valid hosts in each subnet. Calculate for each:

    i.   A subnet mask 255.255.255.192 (/26) and network address 10.0.0.0

                                                                      [5 marks]

    ii.   A subnet mask 255.255.255.192 (/20) and network address 172.16.0.0

                                                                      [5 marks]

QUESTION TWO [20 MARKS]

a) Define the following terms.

    i.   Subnetting   **[1 mark]**

    ii.   Supernetting   **[1 mark]**

    iii.   Subnet Mask   **[1 mark]**

    iv.   Protocol Multiplexing.   **[1 mark]**

b) Special IP addresses are the IP addresses which are reserved for network testing and troubleshooting. These IP addresses cannot be assigned to an end device or an interface. Discuss each of the following reserved addresses.

    i.   127.0.0.0 to 127.255.255.255   **[2 marks]**

    ii.   224.0.0.0 to 239.255.255.255   **[2 marks]**

    iii. 240.0.0.0 to 255.255.255.255   **[2 marks]**

c) Identify and explain any Three (3) types of routing protocols.   **[6 marks]**

d) Discuss how the distance-vector routing protocols find the best path to a remote network by judging distance.   **[4 marks]**

QUESTION THREE [20 MARKS]

a) Differentiate between the following

    i.   IPv4 and IPv6   **[2 marks]**

    ii.   TCP and UDP   **[2 marks]**

    iii.   Broadcast Domain and Collision Domain   **[2 marks]**

b) Discuss each of the following protocols

    i.   Internet Protocol (IP)   **[3 marks]**

    ii.   ICMP Router-Discovery Protocol (IDRP)   **[3 marks]**

    iii.   User Datagram Protocol (UDP)   **[3 marks]**

c) Explain any Five (5) protocols that operate at the Application-Layer of the TCP/IP suite.

                                                           [5 marks]

QUESTION FOUR [20 MARKS]

a) What is the DNS Protocol? [2 marks]

b) As a Network Engineer your responsibility is to troubleshoot, diagnose, and resolve hardware, software, and other network and system problems as well as coordinate computer network access and use. Explain the following protocols to the newly deployed interns in your section.

    i. Who is protocol [3 marks]

    ii. Finger Protocol [3 marks]

    iii. Daytime Service [3 marks]

    iv. Network Time Protocol (NTP) [3 marks]

c) Discuss the advantages and disadvantages of POP3 protocol. [6 marks]

QUESTION FIVE [20 MARKS]

a) Explain the followings.

    i. Flooding [2 marks]

    ii. Distance Vector Routing [2 marks]

    iii. The Count-to-Infinity Problem [2 marks]

b) Compare and contrast between SMTP and HTTP application protocols. [6 marks]

c) Discuss the various types of multiplexing. [4 marks]

d) Explain the concept of SONET multiplexing. [4 marks]