MahindraUniversity ,Hyderabad
Ecole Centrale School of Engineering
Minor-II

Program: B. Tech. **Branch: CSE,ECE and CM** **Semester: VI**
Subject: Computer Networks (CS 3203)

Date: 18.04.2024 **Time: 10.00-11.30AM**
Time Duration: 1.5 Hours **Max. Marks: 50**

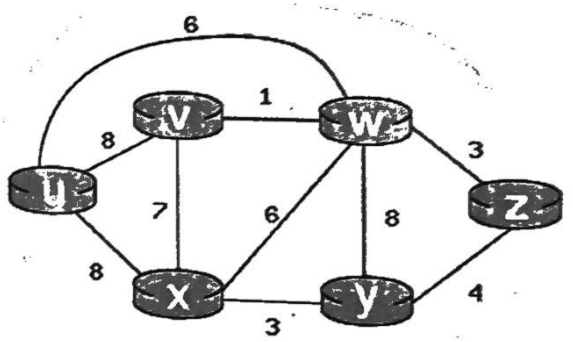
Note: All questions are compulsory.
All sub-questions of a question must be written at one contiguous place.

Q1.a) An organization is granted the block 211.17.180.0/24. The administrator wants to create 32 subnets. **(6+4=10M)**

i. Find the subnet mask.
ii. Find the number of addresses in each subnet.
iii. Find the first and the last address in the first subnet.
iv. Find the first and the last address in the last subnet (subnet 32)

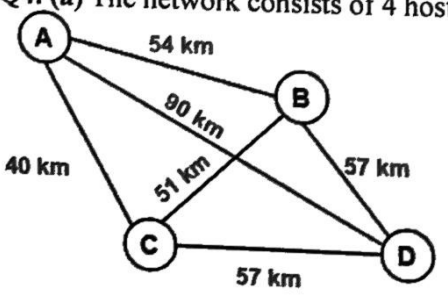
b). A router has just received the following new IP addresses: 57.6.96.0/21, 57.6.104.0/21, 57.6.112.0/21, and 57.6.120.0/21. If all of them use the same outgoing line, can they be aggregated? If so, to what? If not, why not?

Q2. Consider the 6-node network shown below, with the given link costs. **(5+5=10M)**
(a) Give Dijkstra's algorithm, and find the least cost path from source node u to all other destinations. Show your work in tabular format.
(b) Write the steps in Link State Routing. Construct the link state packets for each node of given network.



Q3. (a) Explain the Router Architecture and its types of switching fabrics. **(6+4=10M)**
(b) Draw and explain the fields of IPv4 datagram format.

Q4. (a) The network consists of 4 hosts distributed as shown below-



Assume this network uses CSMA / CD and signal travels with a speed of 3×10^5 km/sec. If sender sends at 1 Mbps, what could be the minimum size of the packet?(choose the maximum distance so that collision can be detected in all the links of the network.) **(3+2+3+2=10M)**

(b) Assume that a source S and destination D are connected through two intermediate routers labled R. Determine how many times each packet has to visit the Network Layer and Data Link Layer during transimission from S to D.

(c) Explain the various forms of CSMA.
(d) Decribe briefly about DHCP.

Q5. *Answer the following questions briefly:* **(4+2+2+2=10M)**
(a) Compare and contrast Bluetooth, Wi-Fi and Wi-Max.
(b) Explain the functionality of ICMP.
(c) An IP datagram of size 1000 bytes arrives at a router. The router has to forward this packet on link whose MTU (maximum transmission unit) is 100 bytes. Assume that the size of the IP header is 20 bytes. Compute the number of fragments that the IP datagram will be divided into for transimission.
(d) Write the translations done by NAT.