**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS),** HYDERABAD-31

**Department of Computer Science and Engineering**

Name of the Subject: Computer Networks

**Assignment** –II

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| **Q.no** | **Question** | **Blooms Taxonomy** | **Mapped** | |
| **CO** | **PO** |
| **Set-I (1602-21-733-5,12,13,20,26,29,32,36,37,63)** | | | |  |
| 1 | If the university has 35 departments and uses class B address. If the use 6 bit subnet number and 10 bit host number then how many Ethernets and maximum hosts in each Ethernet possible? | Applying | 1 | 1,2 |
| 2 | University has 500 LANs with 100 hosts in each LAN. Suppose the University has one Class B addressing scheme. Design an appropriate subnet addressing scheme and how many possible hosts are in each subnet? | Analysis | 1 | 1,2 |
| **SET-II (1602-21-733-1 – to - 4, 6,7,8,305, 306)** | | | |  |
| 1 | A router has the following (CIDR) entries in its routing table:  Address/mask  Next hop  128.114.56.0/22 Interface 0  128.114.60.0/22 Interface 1  192.168.30/23 Router 1  Default Router 2  For packets with the following IP addresses, show where the  router will send the packet  (a) 128.114.63.09  (b) 128.114.57.11  (c) 128.114.52.02  (d) 192.168.33.05  (e) 192.168.31.06 | Applying | 1 | 1,2 |
| 2 | An organization wants to use the network number 192.168.90.0 across four subnets. The maximum number of hosts that exist per subnet will be 25. what mask would you use to solve this problem? | Applying | 1 | 1,2 |
| **SET-III (1602-21-733-9 to 11, 14 to 17,303,304)** | | | | |
| 1 | Host X has IP address 192.168.1.97 and is connected through two routers R1 and R2 to an­other host Y with IP address 192.168.1.80. Router R1 has IP addresses 192.168.1.135 and 192.168.1.110. R2 has IP addresses 192.168.1.67 and 192.168.1.155. The netmask used in the network is 255.255.255.224. Given the information above, how many distinct subnets are guaranteed to already exist in the network? | Applying | 2 | 1,2 |
| 2 | **Consider a network with five nodes, N1 to N5, as shown below.**    **The network uses a Distance Vector Routing protocol. Once the routes have stabilized, the distance vectors at different nodes are as following.**  **N1: (0, 1, 7, 8, 4) N2: (1, 0, 6, 7, 3) N3: (7, 6, 0, 2, 6) N4: (8, 7, 2, 0, 4) N5: (4, 3, 6, 4, 0)**  **Each distance vector is the distance of the best known path at the instance to nodes, N1 to N5, where the distance to itself is 0. Also, all links are symmetric and the cost is identical in both directions. In each round, all nodes exchange their distance vectors with their respective neighbors. Then all nodes update their distance vectors. In between two rounds, any change in cost of a link will cause the two incident nodes to change only that entry in their distance vectors. 52. The cost of link N2-N3 reduces to 2(in both directions). After the next round of updates, what will be the new distance vector at node, N3.** | Applying | 1 | 1,2 |
| **SET-IV (1602-21-733-18,19, 21 to 25,301,302)** | | | |  |
| 1 | An organization has class C network and wants to form subnets for four departments with hosts as follows.  A-72  B-35  C-20  D-18 hosts.  What is the possible arrangement of subnet masks for A,B,C and D? | Applying | 1 | 1,2 |
| 2 | The routing table of a router is shown below   |  |  |  | | --- | --- | --- | | **DESTINATION** | **SUBNETMASK** | **ETHERNET** | | 128.75.43.0 | 255.255.255.0 | Eth0 | | 128.75.43.0 | 255.255.255.128 | Eth1 | | 192.12.17.5 | 255.255.255.255 | Eth3 | | Default |  | Eth2 |   On which interface will router forward packets addressed to destinations 128.75.43.16 and 192.12.17.10 respectively? | Applying | 1 | 1,2 |
| **SET-V (1602-21-27, 28, 30,31,33 to 35,136)** | | | |  |
| 1 | A n Internet Service Provider (ISP) has the following chunk of CIDR-based IP addresses available with it: 245.248.128.0/20. The ISP wants to give half of this chunk of addresses to Organization A, and a quarter to Organization B, while retaining the remaining with itself. What are valid allocation of addresses to A and B? | Applying | 2 | 1,2 |
| 3 | Subnet mask of the network is 255.255.255.224. Suppose a datagram with 192.55.12.120 as D. IP arrived at the network. What is the subnet ID the host belongs to? What is the Host ID? What is the Broadcast Address for the subnet ID found? | Applying | 1 | 1,2 |
| **SET-VI (1602-21-733-38 to 44,67,135,307)** | | | |  |
| 1 | Calculate the shortest path between source A to destination B for the following weighted graph.  pP6tW | Applying | 1 | 1,2 |
| 2 | **A n Internet Service Provider (ISP) has the following chunk of CIDR-based IP addresses available with it: 245.248.128.0/20. The ISP wants to give half of this chunk of addresses to Organization A, and a quarter to Organization B, while retaining the remaining with itself. Which of the following is a valid allocation of addresses to A and B?**  **A 245.248.136.0/21 and 245.248.128.0/22**  **B 245.248.128.0/21 and 245.248.128.0/22**  **C 245.248.132.0/22 and 245.248.132.0/21**  **D245.248.136.0/24 and 245.248.132.0/21** | Applying | 1 | 1,2 |
| **SET-VII (1602-21-733-46 to 49,51 to 54,65,66)** | | | |  |
| 1 | A company needs 600 addresses. Which of the following set of class C blocks can be used to form a supernet for this company?  a. 198.47.32.0 192.47.33.0 198.47.34.0  b. 198.47.32.0 192.47.42.0 198.47.52.0 198.47.62.0  c. 198.47.31.0 192.47.32.0 198.47.33.0 198.47.52.0  d. 198.47.32.0 192.47.33.0 198.47.34.0 198.47.35.0  Justify your answer. | Analysis | 1 | 1,2 |
| 2 | Consider the following three statements about link state and distance vector routing protocols, for a large network with 500 network nodes and 4000 links  [S1] The computational overhead in link state protocols is higher than in distance vector protocols.  [S2] A distance vector protocol (with split horizon) avoids persistent routing loops, but not a link state protocol.  [S3] After a topology change, a link state protocol will converge faster than a distance vector protocol.  Which one of the following is correct about S1, S2, and S3? Justify your answer(A) S1, S2, and S3 are all true  (B) S1, S2, and S3 are all false.  (C) S1 and S2 are true, but S3 is false  (D) S1 and S3 are true, but S2 is false. | Applying | 1 | 1,2 |
| **SET-VIII (1602-21-733-55 to 61,62,64)** | | | |  |
| 1 | **Consider a network with 6 routers R1 to R6 connected with links having weights as shown in the following diagram**    **All the routers use the distance vector based routing algorithm to update their routing tables. Each router starts with its routing table initialized to contain an entry for each neighbour with the weight of the respective connecting link. After all the routing tables stabilize, how many links in the network will never be used for carrying any data?**  **Suppose the weights of all unused links in the previous question are changed to 2 and the distance vector algorithm is used again until all routing tables stabilize. How many links will now** **remain unused?** | Analysis | 1 | 1,2 |
| 2 | Perform CIDR aggregation on the following /24 IP addresses:  200.96.86.0  200.96.87.0  200.96.88.0  200.96.89.0. | Applying | 1 | 1,2 |