National University of Computer and Emerging Sciences, Lahore Campus

Quiz ……5 [BS(CS): Section C] Fall 2023

Computer Networks (Code: CS3001) **Quiz Date: Novemer 23, 2023**

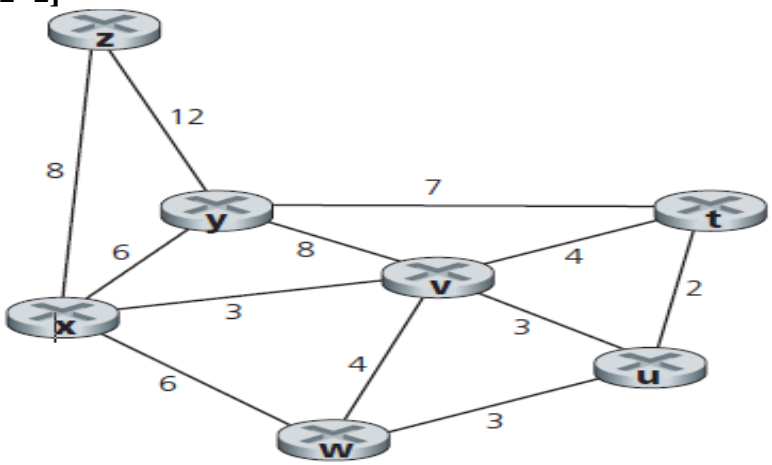
Total Marks: 15 **[CLO 3]** **Duration: 25 -Minutes**

Name ---------- Roll #---------- Section --------

Q1: True or false: When an OSPF route sends its link state information, it is sent only to those which are nodes directly attached neighbors. Explain. **[0.5+1.5=2]**

Q2: True or false: When a BGP router receives an advertised path from its neighbor, it must add its own identity to the received path and then send that new path on to all of its neighbors. Explain. **[0.5+1.5=2]**

Q3: Consider the following network. With the indicated link costs, use Dijkstra's shortest-path algorithm to compute the shortest path from **t** to all network nodes. Show the working of the algorithm in the form of a tabular summary for all iterations (i.e., distance and predecessor for all destinations during each iteration). Moreover, provide the least-cost-path tree from node **t** and resulting forwarding table in **t.**
[7+2+2=2]



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Start writing your answers from here onwards. Yu can use backside of this sheet if needed.

Answers:

Q1: False.

With OSPF, a router broadcasts its link-state information to all other routers in the autonomous system to which it belongs, not just to its neighboring routers. This is because with OSPF, each router needs to construct a complete topological map of the entire AS and then locally runs Dijkstra's shortest-path algorithm to determine its least cost paths to all other nodes in the same AS.

Q2: False.

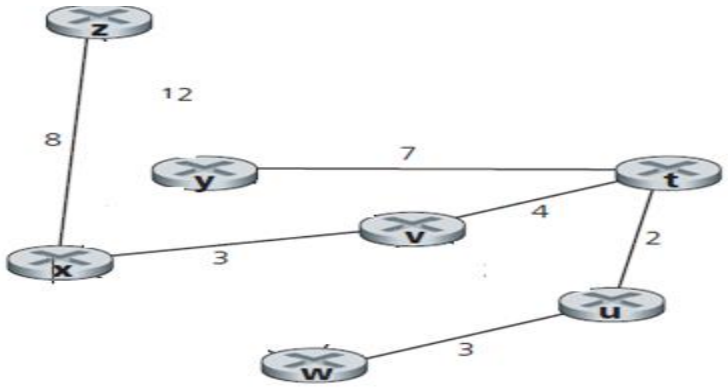
A BGP router can choose not to add its own identity to the received path and send that new path on to all of its neighbors, as BGP is a policy-based routing protocol. This can happen in the following scenario. The destination of the received path is some other AS, instead of the BGP router's AS, and the BGP router does not want to work as a transit router.

Q3:

Tabular Summary

Step	N'	D(x), p(x)	D(u),p(u)	D(v),p(v)	D(w),p(w)	D(y),p(y)	D(z),p(z)
0	t	∞	2,t	4,t	∞	7,t	∞
1	tu	∞	2,t	4,t	5,u	7,t	∞
2	tuv	7,v	2,t	4,t	5,u	7,t	∞
3	tuvw	7,v	2,t	4,t	5,u	7,t	∞
4	tuvwx	7,v	2,t	4,t	5,u	7,t	15,x
5	tuvwxy	7,v	2,t	4,t	5,u	7,t	15,x
6	tuvwxyz	7,v	2,t	4,t	5,u	7,t	15,x

Least cost tree:



resulting forwarding table in x:

destination	outgoing link
u	(t,u)
w	(t,u)
v	(t,v)
x	(t,v)
z	(t,v)
y	(t,y)