SOLUTION ASSIGNMENT-05 (BCS 5A & 5C)

PART-01

Review Questions:

R3.

A centralized routing algorithm computes the least-cost path between a source and destination by using complete, global knowledge about the network. The algorithm needs to have the complete knowledge of the connectivity between all nodes and all links' costs. The actual calculation can be run at one site or could be replicated in the routing component of each and every router. A distributed routing algorithm calculates the lease-cost path in an iterative, distributed manner by the routers. With a decentralized algorithm, no node has the complete information about the costs of all network links. Each node begins with only the knowledge of the costs of its own directly attached links, and then through an iterative process of calculation and information exchange with its neighboring nodes, a node gradually calculates the least-cost path to a destination or a set of destinations.

OSPF protocol is an example of centralized routing algorithm, and BGP is an example of a distributed routing algorithm.

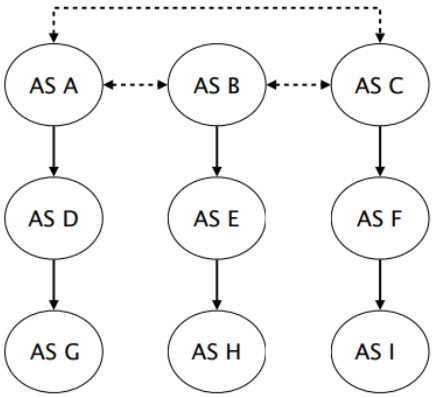
PART-02

Question 1

S	B	C	D	E	F	G
A	2,A	6,A	3,A	∞	∞	∞
A, B	-	6,A	3,A	7,B	∞	∞
A, B, D	-	5,D	-	7,B	11,D	∞
A, B, D, C	-	-	-	6,C	11,D	∞
A, B, D, C, E	-	-	-	-	10,E	∞
A, B, D, C, E, F	-	-	-	-	-	11,F

Question 2

AS-I → AS-F → AS-E. A possible Network is as below:



Question 3

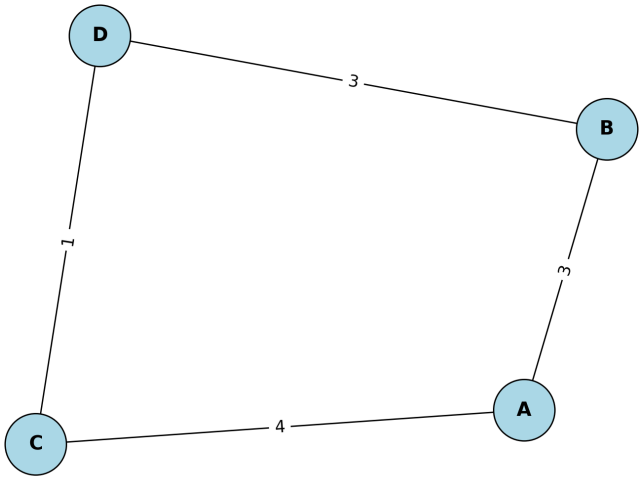
X's view of the topology

W's view of the topology

In the above solution, X does not know about the AC link since X does not receive an advertised route to w or to y that contain the AC link (i.e., X receives no advertisement containing both AS A and AS C on the path to a destination.

Question 4

Network Consistent with Given Distance-Vector Tables



Question 5

Node x table

		Cost to x	y	z
From	x	0	3	4
	y	∞	∞	∞
	z	∞	∞	∞

		Cost to x	y	z
From	x	0	3	4
	y	3	0	6
	z	4	6	0

Node y table

		Cost to x	y	z
From	x	∞	∞	∞
	y	3	0	6
	z	∞	∞	∞

		Cost to x	y	z
From	x	0	3	4
	y	3	0	6
	z	4	6	0

Node z table

		Cost to x	y	z
From	x	∞	∞	∞
	y	∞	∞	∞
	z	4	6	0

		Cost to x	y	z
From	x	0	3	4
	y	3	0	6
	z	4	6	0

Question 6

SOLUTION

1. The minimum distance from node u to node v is 4, and node v's predecessor is node u. The full answer was: 4,u

2. The minimum distance from node u to node w is 3, and node w's predecessor is node u. The full answer was: 3,u

3. The minimum distance from node u to node u is 0, and node u's predecessor is node u. The full answer was: 0,u