1.

a.

Subnet A: 214.97.255/24

Subnet B: 214.97.254.0/25 – 214.97.254.0/29

Subnet C: 214.97.254.128/25

Subnet D: 214.97.254.0/31

Subnet E: 214.97.254.2/31

Subnet F: 214.97.254.4/30

b.

Longest Prefix Interface

Router 1:

11010110 01100001 11111111 A

11010110 01100001 11111110 00000000 D

11010110 01100001 11111110 0000001 F

Router 2:

11010110 01100001 11111111 00000000 D

11010110 01100001 11111110 0 B

11010110 01100001 11111110 00000001 E

Router 3:

11010110 01100001 11111111 000001 F

11010110 01100001 11111110 0000001 E

11010110 01100001 11111110 1 C

2.

Step 0:

Node: Distance from Origin:

X 0 ← Currently being visited

Y 6

Z 8

V 3

W 6

U inf.

T inf.

Step 1:

Node: Distance from Origin:

X 0

Y 6

Z 8

V 3 ←Currently being visited

W 6

U 6

T 7

Step 2:

Node: Distance from Origin:

X 0

Y 6

Z 8

V 3

W 6

U 6 ← Currently being visited

T 7

Step 3:

Node: Distance from Origin:

X 0

Y 6

Z 8

V 3

W 6 ← Currently being visited

U 6

T 7

Step 4:

Node: Distance from Origin:

X 0

Y 6 ← Currently being visited

Z 8

V 3

W 6

U 6

T 7

Step 5:

Node: Distance from Origin:

X 0

Y 6

Z 8 ← Currently being visited

V 3

W 6

U 6

T 7

Step 6:

Node: Distance from Origin:

X 0

Y 6

Z 8

V 3

W 6

U 6

T 7 ← Currently being visited

3.

Step 1:

Node: Distance to:

U V X Y Z

Z inf. 6 2 inf. 0

V inf. Inf. Inf. Inf. Inf.

X inf. Inf. Inf. Inf. Inf.

Step 2:

Node: Distance to:

U V X Y Z

Z 7 5 2 5 0

V 1 0 3 inf. 6

X inf. 3 0 3 2

Step 3:

Node: Distance to:

U V X Y Z

Z 6 5 2 5 0

V 1 0 3 3 5

X 4 3 0 3 2

Step 4:

Node: Distance to:

U V X Y Z

Z 6 5 2 5 0

V 1 0 3 3 5

X 4 3 0 3 2

4.

a.

W: 2

Y: 4

U: 7

b.

For the link between X and Y directly, there will only be a change in the path if the cost of travel between X and Y is less than one. Since the least amount of cost between X and U is 7, there will not be a change in the path if the link between X and Y is greater than or equal to one. If the change is less than one, however, the least cost path will pass through Y and be the new cost plus six. If this is the case, X will update its neighbors. Similarly, if the cost of travel between X and W increases to be greater than six, the least cost path to U now passes through Y.

c.

Any change in link cost where the path between X and Y is greater than or equal to one will not cause X to inform its neighbors that there is a new least cost path to U.

5.

Initial:

Node: X Distance to:

X Y Z

X 0 3 4

Y inf inf inf

Z inf inf inf

Node: Y Distance to:

X Y Z

X inf inf inf

Y 3 0 6

Z inf inf inf

Node: Z Distance to:

X Y Z

X inf inf inf

Y inf inf inf

Z 4 6 0

After update:

Node: X Distance to:

X Y Z

X 0 3 4

Y 3 0 6

Z 4 6 0

Node: Y Distance to:

X Y Z

X 0 3 4

Y 3 0 6

Z 4 6 0

Node: Z Distance to:

X Y Z

X 0 3 4

Y 3 0 6

Z 4 6 0

The last iteration is the same as the “after update” iteration, as the values do not improve.