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Computer Networks[CS31006] Class test 4
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1.
(a)
N = 1006
Number of subnets for :

- Administration needs 1006 hosts
    - 1 subnet : maximum 10 bit host address = 1024 required
    - waste : 22
- Hostel 1 needs 2012 hosts
    - 1 subnet : maximum 11 bit host address = 2048 required
    - waste : 21
- Hostel 2 needs 3018 hosts
    - 2 subnets needed
        - Subnet 1 : 11 bit host address = 2048
        - Subnet 2 : 10 bit host address = 1024
        - waste : 54
- Residential needs 1006 hosts
    - 1 subnet : 10 bit host address = 1024
    - Waste : 22
- Academic 1 needs 5030 hosts
    - 2 subnet required
        - Subnet 1 : 12 bit host address =4096
        - SUbnet 2 : 10 bit hosts address = 1024
        - Waste : 90
- Academic 2 needs 6036 hosts
    - 6 subnets required
        - Subnet 1 : 12 bit host address = 4096
        - Subnet 2 : 10 bit host address = 1024
        - Subnet 3 : 9 bit host address = 512
        - Subnet 4 : 8 bit host address = 256
        - Subnet 5 : 7 bit host address = 128
        - Subnet 6 : 5 bit host address = 32
        - Waste = 12

(b)
Subnet masks for

- Administration = 22 (10 bit host)
- Hostel 1 = 21 (11 bit host)
- Hostel 2 = 19 (11 bit host + 2 bit for subnet)
- Residential = 22 (10 bit host)
- Academic 1 = 18 (12 bit host + 2 bit for 2 subnet)
- Academic 2 = 17 (12 bit host + 3 bit for 6 subnet)

(c)
max 15 bit for hosts(max in academic 2) + 3 bit for 6 blocks
= 18 bit for host address

Subnet mask = 32-18 = 14 for university

(d) NKN gave 13.0.0.0/8
Ip address for university = 13.4.0.0/14

(e)

- Administration = 13.4.128.0/17
- Hostel 1 = 13.5.0.0/17
- Hostel 2 = 13.5.128.0/17
- Residential = 13.6.0.0/17
- Academic 1 = 13.6.128.0/17
- Academic 2 = 13.7.128.0/17

(f)

Network ip	Subnet mask	Next hop field
13.4.128.0	255.255.128.0	GW_ADMIN
13.5.0.0	255.255.0.0	GW_H1
13.5.128.0	255.255.1.0	GW_H2
13.6.0.0	255.255.0.0	GW_RES
13.6.128.0	255.255.128.0	GW_AC1
13.7.128.0	255.255.128.0	GW_AC2

2.

At every iteration, in distance vector algorithm, we compute the shortest distance from the sink node to all other nodes. The algorithm is destination centric. In the internet, number of nodes in the graph are not fixed.The algorithm accommodates the inclusion and exclusion of connections in the network. As we move closer to the destination,the distance reduces.But in bellman ford , there is a guarantee of convergence due to known number of nodes in the graph.

To resolve the count to infinity problem in RIP, the maximum no. of hops is limited to 16 in the network.