18CS10048 Sahil Jindal

Ans 1. N = 1004
So, IP addresses: Administration – 1004, Hostel-1 – 2008, Hostel-2 – 3012, Residential – 1004, Academic-1 – 5020, Academic-2 – 6024

A. We create subnets as follows:
   (a)Administration: no subnet
   (b)Hostel 1: no subnet
   (c)Hostel 2: 2 subnets: 2048 and 1024
   (d)Residential: no subnets
   (e)Academic 1: 2 subnets: 4096 and 1024
   (f)Academic 2: 2 subnets: 4096 and 2048
   So a total of 6 subnets is required.
   Allocations:
   Administration: Allocate 10 bits
   Hostel 1: Allocate 11 bits
   Hostel 2: 2 subnets: 2048(Allocate 11 bits) and 1024(Allocate 10 bits)
   Residential: Allocate 10 bits
   Academic 1: 2 subnets: 4096(Allocate 12 bits) and 1024(Allocate 10 bits)
   Academic 2: 2 subnets: 4096(Allocate 12 bits) and 2048(Allocate 11 bits)

B.
   (a) 255.255.252.0
   (b) 255.255.248.0
   (c) 255.255.224.0
   (d) 255.255.252.0
   (e) 255.255.192.0
   (f) 255.255.192.0

C. 255.254.0.0

D. 13.250.0.0/20

E. 13.250.64.0
   13.250.128.0
   13.250.192.0
   13.251.0.0
   13.251.64.0
   13.251.128.0

F.

Network Ip	Subnet Mask	Next Hop
13.250.64.0	255.255.192.0	GW_ADMIN

13.250.128.0	255.255.192.0	GW_H1
13.250.192.0	255.255.192.0	GW_H2
13.251.0.0	255.255.192.0	GW_RES
13.251.64.0	255.255.192.0	GW_AC1
13.251.128.0	255.255.192.0	GW_AC2

Ans 2. We can only compute the shortest path from S to all other nodes with Distance Vector routing as we do not know the structure of the graph for the entire network and because updates happen asynchronously, we cannot be sure that the distance is shortest.

If we do not limit the number of hops, it might happen in RIP that a peer is unreachable in the case when the link gets down resulting in the count to infinity problem.