Wireless & mobile Network Assignment-2

1: An institute campus has a hostel. The hostel has 4 wings (w1, w2, w3, w4). Each wing has 8 rooms. Room numbers are r1, r2 ... r32. Each room needs one Wi-Fi connection. Single AP can connect maximum 8 stations and has routing capabilities. All AP's are connected to a layer 3 switch (rs1). The switch rs1 is placed between wing w2 and wing w3. The rs1 switch is connected to another layer three switch rs2 placed in the campus at a distance of approximately 1 Km. Switch rs2 is connected to a gateway router (rg) which is connected to rest of the Internet through ISP router. IP address block assigned for the Institute is 202.141.80.0/24.

i) Design a campus wide Wi-Fi solution so that the hostel rooms can be connected to rest of the Internet. Specify topology, AP'S, channels of AP'S and connected nodes,cables type, switchs ports type, routing table entries of layer three switches & ISP router. Each wing requires separate subnet. You should tell how many maximum IP addresses are sufficient for each wing, with subnet IP addresses with netmask. Give IP address of rooms.

ii) A node (CN) having IP 202.141.64.10/24 connect to a mobile node (MN) having IP 202.141.96.10/24 with HA address as 202.141.96.1/24. MN has moved to room number r1 of wing w1 of the hostel while connected to the CN. Show the changes inside the network and delivery of the packet p1 from CN to MN and of packet p2 from MN to CN use mobile IP (MIP).

MN moves to room number r25 situated in wing w4. Show the changes inside the network and delivery of packet p3 from CN to MN and packet p4 from MN to CN use MIP. State any assumption taken.

iii) Design a solution for above campus using CISCO CAPWAP

2:show delivery of an IP packet (P) to a mobile node (MN) from a corresponding node (CN). Assume mobile node is in foreign network and registered.
Consider IP addresses as:
CN---200.1.1.5/24,
HA---200.2.1.6/24,
FA---200.3.1.7/24,
MN old IP 200.2.1.10/24 and
MN gets care of address 200.3.1.7/24. Hardware address of FA = H-FA, HA = H-HA and of MN = H-MN. You are also required to show table entries done at HA and at FA during the registration process when MN moved from the home network to the foreign network. If CN is in 200.2.1.0/24 network with an address 200.2.1.100/24 how packet P will be send to MN from CN.

3: If H.A address is 205.50.40.3 and F.A address is 208.80.70.4 show how IP-in-IP encapsulation/de-capsulation will take place for a packet with S.A 196.6.5.3 and D.A as 205.50.40.6.
4: How route is optimized for problem no.2 and show delivery of the packet on this optimized route.
5: How two mobile nodes can use the same COA in mobile IP?
6: In what conditions home agent intercepts the ARP packet destined for mobile host. Explain proxy ARP in mobile IP.
7: "IP address change required by network layer during mobility creates problem for TCP" Discuss.