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i). Identify and validate the needs of flow control techniques.

ii). Given Scenario:- Assume in Selective Repeat ARQ protocol m= 3 and window size is 8. Suppose the sender sends 0 to 6 and the receiver acknowledges all of them one by one. Assume that all the acknowledgments are lost (0 to 6). Draw the diagram neatly and answer the following:-

a. Write Sf and Sn values at each step.  
b. What are the sequence numbers?  
c. Is window size and sequence numbers equal?  
d. What is the chance of getting duplicate frames at the receiver side?  
e. How many duplicate frames?  
f. What is the solution to the problem?

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i). Identify and validate the needs of flow control techniques.

ii). Given Scenario:- Assume in go back ARQ protocol, 3 bits for sequence number and window size is 8. Suppose the sender sends 0 to 6 and the receiver acknowledges all of them one by one. Assume that all the acknowledgments are received except 3 and 6. Draw the diagram neatly and answer the following:-

a. Write Sf and Sn values at each step.  
b. What are the sequence numbers?  
c. Is window size and sequence numbers equal?  
d. What is the chance of getting duplicate frames at the receiver side?  
e. How many duplicate frames?  
f. What is the solution to the problem?

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The following ip addresses will be used to design a campus network: 10.10.10.10 ; 10.75.10.120 ; 10.2.10.110 ; 10.25.10.100 ; 10.140.10.90 ; 10.35.10.80 ; 10.45.10.70 ; 10.65.10.15 ; 10.85.10.20; 10.129.10.30 ; 10.150.10.40 ; 10.194.10.50 ; 10.205.10.60 ; 10.215.10.130 ; 10.223.255.255 ; 10.63.255.254 ; 10.127.255.255 ;

Note: The design objectives are to ensure a secure network and ease of administration.

i. Find out how many routers are required to design the campus network ??  
ii. How many sub-networks are there in the campus network? iii. How many computers are present in the campus network? iv. How many bits will be borrowed from the host part? v. Compute the custom subnet mask.  
vi. In every possible sun-net, identify the network address, broadcast address, first host address, last host address, and a total number of usable host addresses.  
vii. Illustrate the campus network with respect to the given ip addresses.

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The following ip addresses will be used to design a campus network:- 192.10.10.10 ; 192.10.10.75 ; 192.10.10.2 ; 192.10.10.25 ; 192.10.10.140 ; 192.10.10.35 ; 192.10.10.45 ; 192.10.10.65 ; 192.10.10.85; 192.10.10.129 ; 192.10.10.150 ; 192.10.10.194; 192.10.10.205 ; 192.10.10.215 ; 192.10.10.223 ; 192.10.10.63 ; 192.10.10.127 ;

Note: The design objectives are to ensure a secure network and ease of administration.

i. Find out how many routers are required to design the campus network.

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Analyse the CSMA/CD technique with respect to the following criteria

· Round-trip time  
· Collisions

Analyse the Slotted Aloha technique with respect to the following criteria

· Performance  
· Necessary conditions

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