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(1)

(a) Ans

- i) possibility of collision and nodes might not be able to detect them
- ii) difficult to send and receive packets at the same time.

(b) Ans

It would be better to use CSMA/CD for transferring streaming media because it can minimize the transfer delay.

(2)

Iteration	R ₁	R ₂	R ₃	R ₄	
0	∞	∞	∞	∞	
1	∞	∞	1, R ₅	9, R ₅	
2	8, R ₃	3, R ₃	1, R ₅	9, R ₅	
3	6, R ₂	3, R ₃	1, R ₅	8, R ₂	
4					
5					

3i)

- a. true
- b. true
- c. false
- d. true

ii)

- c. forward the frame over all ports except the one on which it was received.

(4)

Ans

- transport layer protocols : UDP
TCP

- Application layer protocols : DNS and HTTP

(c)

No, the receiver cannot be absolutely certain that no bit errors have occurred. This is because of the manner in which the checksum for the packets is calculated. If the corresponding bits of two 16-bits in the packet were 0 and 1 then even if these get flipped to 1 to 0 then the sum still remains the same. Hence, the 1's complement the receiver calculates will be same which means the checksum will verify even if there was transmission error.

(6)

let suppose number of routers be n

Number of interfaces IP packet travels = $(n \times 2) + 2$

Number of forwarding tables entries = n

(7)

Ans

after 5th collision

if chooses from $2^5 = 32$ nodes = {0, 1, 2, ..., 31}

Now,

the probability that a node chooses 4 is $P(4) = 1/32$

$$\text{Delay} = \frac{k \times 512}{10} = \frac{4 \times 512}{10} = 204.8 \text{ microseconds}$$

(8)

(a) the two AP will have different SSID and Mac address. A wireless station at my home and neighbour's home will connect with one of the APs. This would create a link between new packets and AP. Even though different level of AP will receive the packet, they won't act as it is not addressed to them. Thus, only specific AP will act and process. So, Two ISP can work in parallel over the same channel and will be sharing the same wireless bandwidth.

(b) Ans

If one AP operates over channel 1 and other over channel 11 then there will not be a collision because there are two wireless station and different channels are used for transmitting packets.

9) M^n

a. $A - D - E$

b. $C - E - D$

(10)

Ans

the following sequence of events will occur

NKEBMCGDAIFHLO