EE 450 HW#3 Yuhang Xiao

P18.

A will finish transmitting at $t = 512 + 64 = 576$ bit time
In the worst case, B senses transmitting at time $t = 324$ bit time, which is right before the first bit of A arrives. Then, the first bit of B will arrive at A at $t = 324 + 325 = 649$ bit time > 576
Thus, A finishes transmitting before detecting B has transmitted and A incorrectly thinks the frame was successfully transmitted.

P19.

A and B will finish transmitting jam signal at $t = 293$ bit time, A senses idle medium at $t = 293 + 245 = 538$ bit time. A will retransmit at $t = 538 + 96 = 634$ bit time. Thus, the first bit of A's retransmission will arrive at B at $t = 634 + 245 = 879$ bit time.
While B's scheduled retransmission time is $t = 293 + 512 + 96 = 901$ bit time > 879 bit time.
So there will be no collision in retransmission because B is refrained while A is retransmitting

P 22.

(i) Source MAC addr. : A's MAC addr.

Destination MAC addr. : MAC addr. of right router's left port

Source IP : A's IP

Destination IP : F's IP

(ii) Source MAC addr. : A's MAC addr.

Destination MAC addr. : MAC addr. of right router's left port

Source IP : A's IP

Destination IP : F's IP

(iii) Source MAC addr. : MAC addr. of right router's right port

Destination MAC addr. : F's MAC addr.

Source IP : A's IP

Destination IP : F's IP

P 23.

Because these nodes are connected by switches, the maximum total aggregate throughput could be

$(9+2) \cdot 1\ \text{Gbps} = 11\ \text{Gbps}$

P24.

For each hub, the throughput could be 1 Gps. Thus, the total aggregate throughput could reach a maximum of $3 \cdot 1 + 2 = 5$ Gbps

P25.

Because all links are 1 Gps and all nodes are connected by hubs, the total aggregate throughput only have a maximum of 1 Gbps.

P26.

(i) switch table:

MAC addr.	interface
empty	

⇒

MAC addr.	interface
B	B's interface

don't know the interface of E, so frame will be forwarded to A, C, D, E, F. Switch is in flooding mode.

(ii) switch table:

MAC addr.	interface
B	B's interface

⇒

MAC addr.	interface
B	B's interface
E	E's interface

Switch know the interface of B, so frame will only be forwarded to B. Switch is in forwarding mode.

(iii) switch table:

MAC addr.	interface
B	B's interface
E	E's interface

⇒

MAC addr.	interface
B	B's interface
E	E's interface
A	A's interface

Switch know the interface of B, so frame will only be forwarded to B. Switch is in forwarding mode.

(iv) switch table:

remains the same as that after event (iii)

Switch know the interface of A, so frame will only be forwarded to A. Switch is in forwarding mode.

PS.

a.

It will not completely break down because each AP will have different SSID and MAC address. Thus, each station will be associated with one AP and two APs can work in parallel. However, when two stations with different ISP transmit at the same time, they will cause a collision because they are sharing the channel. Thus, their aggregate transmission rate is 11 Mbps according to 802.11b.

b.

Channel 1 and Channel 11 will have no overlapping. Thus, there will be no collision. The aggregate transmission rate is 22 Mbps according to 802.11b.