P1:

1. A🡪S: source port numbers=467; destination port numbers=23.
2. B🡪S: source port numbers=513; destination port numbers=23.
3. S🡪A: source port numbers=23; destination port numbers=467.
4. S🡪B: source port numbers=23; destination port numbers=513.
5. Yes
6. No

P4:

1. Adding the two bytes gives 11000001. Taking the one’s complement gives 00111110.
2. Adding the two bytes gives 01000000. The one’s complement gives 10111111.
3. First byte = 01010100; second byte = 01101101.

P5:

No, the receiver cannot be absolutely certain that no bit errors have occurred,

Because of the manner in which the checksum for the packet is calculated. If the corresponding bits of two 16-bit words in the packet were 0 and 1 then even if these get flipped to 1 and 0 respectively the sum still remains the same. The checksum will verify even if there was transmission error.

P15:

15000\*8/10^9 = 12 microseconds.

Util = 0.98 = 0.012\*n/30.012 🡪 n = 2451

P26：

Possible sequence numbers: 2^32 = 4294967296

1. It increases by the number of bytes of data sent. So the size of the MSS is irrelevant—the maximum size file that can be sent from A to B is simply the number if bytes : 2^32 = 4.19Gbytes.
2. The number of segments is [2^32/536]=8012999.

66 bytes of header get added, so the total is 2^32 + 528857934 = 4.824x10^9 bytes.

Thus it would take 249 seconds to transmit.