

Homework 7

22. The packet contains 60 bytes, so the Ethernet frame will contain 78 bytes, more than the required 64 bytes. So **no pad** is necessary.

23. Evidently the 1518-byte figure includes the MAC header and trailer, with no pad and no preamble, which is 18 more bytes than the 1500-byte figure that is normally quoted for the packet or data portion. So the figure is **not** wrong.

29. $P(\text{any one bit damaged}) = 10^{-7}$

Bit rate = $11(10^6)$ bit/s

Rate of damaged bits = (bit rate) * $P(\text{any one bit damaged}) = 1.1$ bit/s

Since the rate of frame transmission is $(11)(8)(64)$ Mbit/s,
then the expected value of damaged bits per frame is very low.

Therefore we expect no frame to contain more than one damaged bit.

Therefore the rate of damaged frame transmission is **1.1 fr/s**

Another path to the same answer:

$P(\text{any one frame damaged}) = (8)(64)(10^{-7})$

Frame transmission rate = $11(10^6)$ bit/s (1 byte/8 bit)(1 fr/64 byte)

Rate of damaged frames = (frame rate) * $P(\text{any one frame damaged})$

Rate of damaged frames = **1.1 fr/s**