

## p6q3 Digital Communication

a) latency - delay from putting symbols into channel to getting them out

capacity - rate at which symbols can be placed in or taken out of channel.

b) no

c) higher layer channel which relies on end-to-end acknowledgements will be limited by ~~the~~ round trip time, i.e.

delay for single block in simple ARQ is

$$\frac{B}{r} + 2T_d$$

where  $B$  is block size,  $r$  capacity,  
 $T_d$  delay ~~time~~ (one way) on channel.

if  $B/r$  small compared to  $2T_d$

then capacity of higher layer channel is  

$$\frac{B}{2T_d}$$

p693 (cont'd)

d) sliding window (and large window)  
effectively means B/r becomes large  
w.r.t.  $2Td$

e) interactions at application layer  
often involve small amount of information  
so large window size doesn't help.