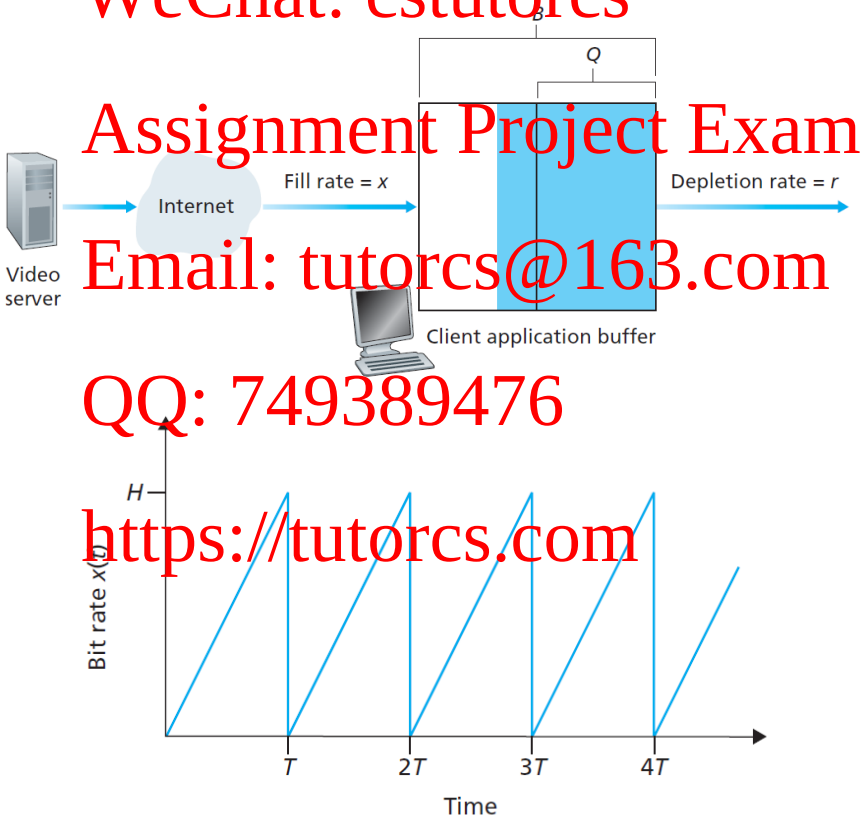
COMP 5416 Week 7

1. Recall the simple model for HTTP streaming shown as follows. B denotes the size of the client's application buffer, and Q denotes the number of bits that must be buffered before the client application begins playout. Suppose the buffer size is infinite but the server sends bits at variable rate $x(t)$. Spe) has the following saw-tooth shape. The rate is initially zero at time t bs to H at time $t = T$. It then repeats this pattern again and again, as shown i

(1). What is the serve ?

(2). Now suppose Q ine as a function of Q, H, and T the time at which playback first begins.

(3). Suppose $H > 2r$ and $Q = HT/2$. Prove there will be no freezing after the initial playout delay.



2. Consider the figure below. A sender begins sending packetized audio periodically at $t = 1$. The first packet arrives at the receiver at $t = 8$.

(1). What are the delays (from sender to receiver, ignoring any playout delays) of packets 2 through 8?

(2). If audio playout begins as soon as the first packet arrives at the receiver at $t = 8$, which of the first eight packets sent will *not* arrive in time for playout?

(3). If audio playout l[illegible] of the first eight packets sent will not arrive in time for playout?

(4). What is the mini[illegible] the receiver that results in all of the first eight packets arriving in time for th[illegible]