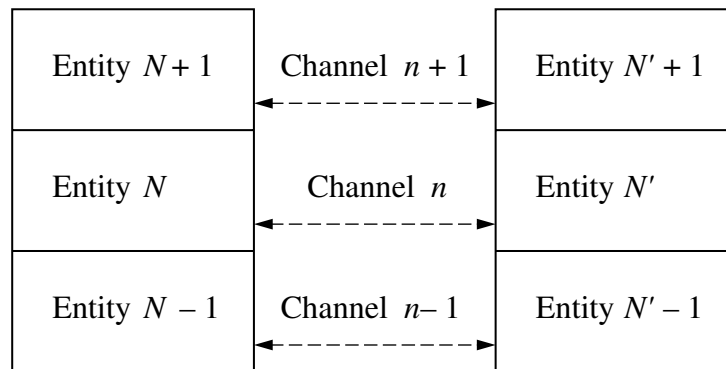


2008 Paper 12 Question 3

Digital Communication I

(a) Describe *five* physical properties of a communications channel. [5 marks]

(b) Consider the figure below. Entities N and N' use an ARQ system.



(i) Explain how the latency of channel $n - 1$ can have a direct effect on the capacity of channel n . [6 marks]

(ii) Define *windowing* as it relates to an ARQ system and describe how the capacity of the ARQ system may be improved through its use. [4 marks]

(iii) If an ARQ system is used for an interactive session, the ARQ system can lead to many small packets, each under-full and perhaps sent with significant overhead. Design and describe an algorithm that overcomes the limitation of sending many mostly-empty packets for an interactive session. [5 marks]