IS8055556: Data and Computer Communications	**Recitation 5**
Semester 2 5785	**29 April 2025**
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Stop and Wait and Effective Bandwidth

1 Sending ACKs and Effective Bandwidth

(a) Calculate the total time required to transfer a 19 MB file over a network with an RTT of 150 ms and a bandwidth of 16 Kbps. The file is sent using packets. After each packet, the sender waits for an ACK from the receiver. File packets are 4.5 KB and ACK packets are 30 B.

Give the total time it will take from the time the first bit of the first packet is sent until the last bit of the last ACK arrives.

Give your answer in milliseconds. Round to the nearest millisecond.

(b) Calculate the effective bandwidth for the sending, that is what was the effective bandwidth achieved for sending the file.

Give your result in Mbps. Round to the nearest 0.001.

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