

Name:

Entry No.

Question-Answer sheet for course Computer Networks (CSL374, CS372F, CSL672)

Total Time: Two hour (3:30pm-5:30pm).

All questions carry equal marks (10 marks each).

Answer any one of the two questions. If you attempt both questions, best one will be counted.

1. Let γ be the expected number of transmitted frames from A to B per successfully accepted packet at B . Let β be the expected number of transmitted frames from A to B between the transmission of a given frame and the reception of feedback about that frame (including the frame in transmission when the feedback arrives). Let p be the probability that a frame arriving at B contains errors (with successive frames assumed independent). Assume that A is always busy transmitting frames, that n is large enough that A never goes back in the absence of feedback, and that A always goes back on the next frame after hearing that the awaited frame contained errors. Find γ in terms of p and β .
2. A cellular radiotelephone system serves a given geographical area with m radiotelephone channels connected to a single switching center. There are two types of calls: radio-to-radio calls, which occur with a Poisson rate λ_1 and require two radiochannels per call, and radio-to-nonradio calls, which occur at Poisson rate λ_2 and require one radiochannel per call. The duration of all calls is exponentially distributed with mean $\frac{1}{\mu}$. Calls that cannot be accommodated by the system are blocked. Give formulas for the blocking probability of the two types of calls.