IME625: Introduction to Stochastic Processes
Quiz-4 Part-1, March 30, 2022

Duration: 5:15 to 5:30 pm **Maximum marks: 5**

Join zoom meeting (same as that of the class) with camera on.

Instructions: *Write your answer on white paper, take its photo at the end of this part of the exam (5:30 pm), create a pdf and submit it via mookit, which would accept submissions till 5:40 pm. In case you have difficulty accessing mookit, you shall email or whatsapp me the pdf. Don't use multiple channels for answer submission. Answers received after 5:40 pm will attract heavy penalty, and those received after 5:45 pm will not be considered for grading. Hand-written answers on digital writing pad will be accepted*.

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1. Consider a two-server system in which customers are served first by server-1 (S1) and then by server-2 (S2). Service times of the servers are independent exponential random variables with rates λ_1 and λ_2. Upon arrival, customer C finds S1 to be occupied by customer B and S2 to be occupied by customer A. A server can serve one customer at a time.

a) Find the probability that A is still in service when C moves to S2. [Marks: 1.5]
b) Find the probability that B is served by S2 when C moves to S2. [Marks: 2.5]
c) How will you find the expected time that C spends in the system? [Marks: 1]

Hint: Events in a-b and one more event are mutually exclusive and collectively exhaustive.