

## EC 633, Queueing Systems, QUIZ-II

Name: \_\_\_\_\_

Roll No.: \_\_\_\_\_

1. Consider an M/G/1 system where the first and second moments of a normal service time are  $\bar{X}$  and  $\bar{X}^2$ , respectively. However, the first and second moments of the *first service duration in a busy period* are  $2\bar{X}$  and  $\bar{X}^2$ , respectively. Use the *Residual Life approach* to find the mean waiting time in queue  $W_q$  and the mean time spent in system  $W$  for a job arriving to the system under equilibrium conditions.
2. Consider a M/G/1 queue with three priority classes where class 3 has the highest priority and class 1 the lowest. For the  $i^{\text{th}}$  class, the job arrival rate is  $\lambda_i$  with  $\bar{X}_i^n$  as the  $n^{\text{th}}$  moment of its service time. It is given that class 3 and class 2 have preemptive resume priority over class 1 but class 3 has only non-preemptive priority over class 2. Use the *Residual Life approach* to find the mean time spent in system by a job for each class.

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  2. Consider a M/G/1 queue with three priority classes where class 3 has the highest priority and class 1 the lowest. For the  $i^{\text{th}}$  class, the job arrival rate is  $\lambda_i$  with  $\bar{X}_i^n$  as the  $n^{\text{th}}$  moment of its service time. It is given that class 3 has pre-emptive resume priority over class 2 and class 1 but class 2 has only non-preemptive priority over class 1. Use the *Residual Life* approach to find the mean time spent in system by a job for each class.