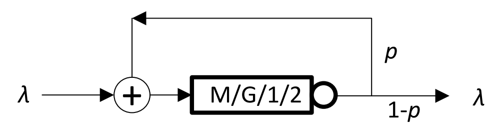
EE633 2014-2015F

Quiz – II

Time: 45 minutes *Marks 10*

1. The arrival rate to a M/G/1/2 queue is given to be λ. The service time distribution is given by pdf $b(x)$, CDF $B(x)$,Laplace Transform $L_B(s)$=L.T. ($b(x)$), mean $\overline{X}$ and second moment $\overline{X^2}$. Derive the equilibrium state probability distribution of the queue as seen at any arbitrary time instant. (*Steps must be clearly given*.) **For notational convenience, use** $\rho = \lambda\overline{X}$ **[5]**

2. The M/G/1/2 queue of Problem 1 is used with feedback as shown where the arrivals to the overall system are assumed to be coming from a Poisson process with rate λ. The service time characteristics of the M/G/1/2 queue itself are the same as in Problem 1. The feedback operates such that a job which is fed back moves to the front of the queue and starts getting served immediately once again.



If this queue is now observed at an arbitrary time instant, what will be the equilibrium state probability distribution that would be seen? **For notational convenience, please still use** $\rho = \lambda\overline{X}$ **[5]**