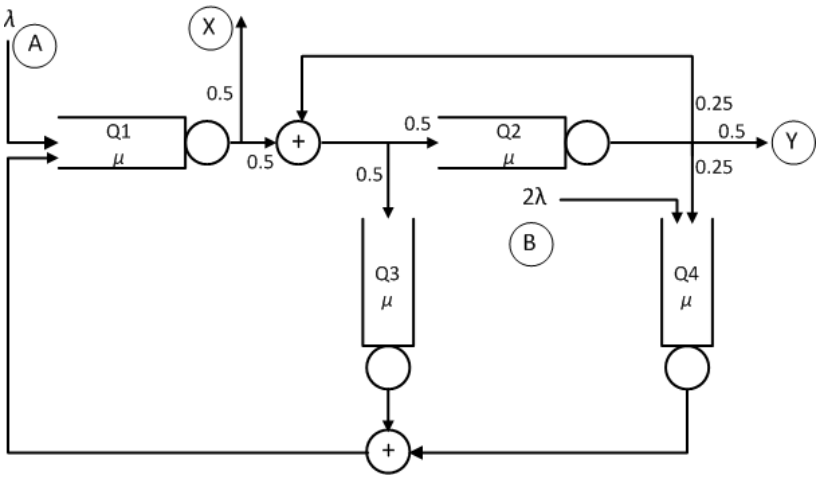
EE 633
Quiz -II

Maximum Marks 10

1. Consider a FCFS $M^{[X]}/G/1$ queue where the arrivals come in batches of one, two or three jobs. The generating function of the batch sizes is given to be $0.25z+0.25z^2+0.5z^3$. The batch arrival rate is λ from a Poisson process.
The first job of the batch has a random service time with its n^{th} moment given as α(n) and the L.T. of it pdf given as $L_\alpha(s)$. The second job of the batch has a random service time with its n^{th} moment given as β(n) and the L.T. of its pdf given as $L_\beta(s)$. The third job of the batch has a random service time with its n^{th} moment given as γ(n) and the L.T. of its pdf given as $L_\gamma(s)$. The service times of the first, second and third jobs are independent of each other.

What will be the mean queueing delay W_q for an arbitrary job (first, second or third in a batch) and the L.T. $L_{Wq}(s)$ of its pdf? **[5]**

2. Consider the open network of M/M/1 queues as shown where each queue has service rate μ. For notational convenience, use ρ=λ/μ



(a) What is the condition for this queueing network to be stable? **[1]**

(b) For λ=0.2 and μ=1, find the transit delay through the network for each of the following –

(i) Jobs entering from A or B and leaving from X or Y **[2]**
(ii) Jobs entering from A and leaving from X or Y **[2]**