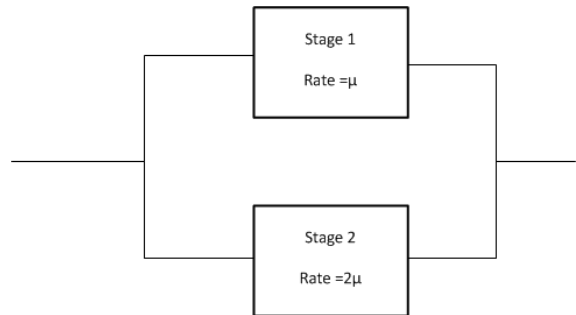


EE 633, Quiz –I
31-JAN-2012

1. Consider an M/M/2 queue where once the system becomes empty, service starts again only when there are 2 jobs in the system – after that the system behaves normally until it becomes empty once again. Assume the arrival rate to be λ and the service rate of each server to be μ .

- (a) Draw the State Transition Diagram for your definition of the system state **[2]**
 (b) Use (a) to derive the probabilities of finding j customers in the system for $j=0,1,2, \dots$ **[4]**

2. Batch arrivals come to a $M^{[X]}/-/1/2$ queue with batch arrival rate λ where each batch has either one or two jobs with probability 0.5 for each. The service facility has two stages as shown and the job may be sent for service to either stage with probability 0.5 – after service at that stage is complete, the job leaves the system. The service time distribution for each stage is exponential with rates as shown.



Draw the State Transition Diagram for both the WBAS and PBAS strategies **[2+2]**