Student Name: **Student Number:**

1. Consider a computer system with ***one CPU*** and ***two disks*** used to support a database server. To guarantee acceptable QoS levels, at most ***one user*** is allowed to be logged onto the database system at any one time. A typical transaction requires a total of ***6 seconds*** of CPU time, ***10 seconds*** of disk1 time, and ***15 seconds*** of disk2 time. Use the Markov model and find the following:
    - **a.** Utilization of resources
    - **b.** System throughput
    - **c.** Number of transactions at each resource
    - **d.** Residence time of transactions at each resource
    - **e.** System response time
2. Figure 1 depicts the generalized birth-death state space diagram of a system. Use birth-death model and find the following:
    - **a.** Utilization of the system
    - **b.** Throughput of the system.
    - **c.** Number of requests at the system
    - **d.** Response time of the system.

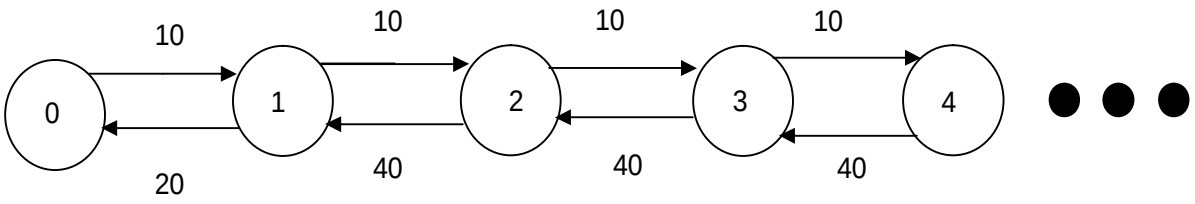

Figure 1. generalized birth-death state space diagram of the system