CENG 455 – Homework 2(Solutions)

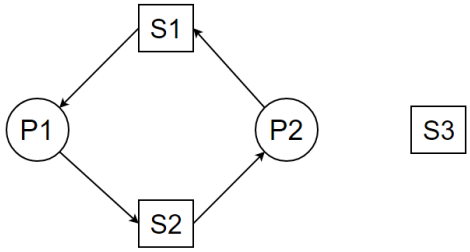
(Deadline: Tuesday 28th Feb 2019)

Name: **Student ID:**

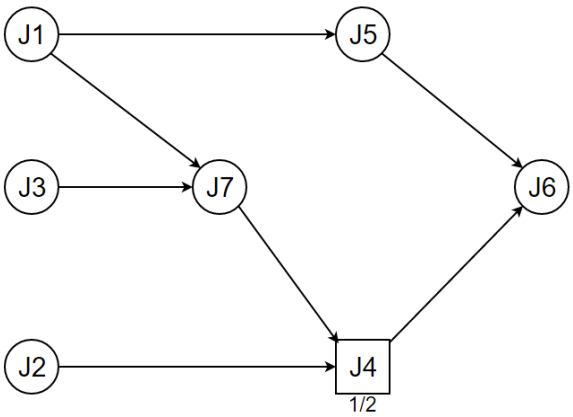
1- [10 points] Given the following two round-robin processes, find a deadlock state. Derive the resource allocation graph of this state and show that it indeed is a deadlock.

Process 1	**Process 2**
P(S1)	P(S2)
.	.
.	.
.	.
P(S2)	if *(condition)* {P(S1)
	V(S1)}
V(S1)	P(S3)
.	.
P(S3)	V(S2)
V(S3)	V(S3)
V(S2)	

If (condition == true) and P1 gets pre-empted after P(S1) and before P(S2), P2 will acquire the lock for S2 and the RAG will be as follows:



2- [10 points] The following task graph shows the dependencies between jobs in a real-time system. The release time and execution time for each job is given in the table below. Job J_i has higher priority than J_k if i<k. Assuming preemptive scheduling, and only one processor in the system, draw the scheduling Gantt chart for this graph. *(Hint: Pay attention to the type of nodes in the graph which shows the type of precedence, i.e. AND or OR, for each job.)*



Job ID	Release time	Execution time
1	0	2
2	4	4
3	0	4
4	12	3
5	5	5
6	20	3
7	0	4