## ST.JOSEPH'S COLLEGE OF ENGINEERING

## ST.JOSEPH'S INSTITUTE OF TECHNOLOGY

### CS6401-OPERATING SYSTEM

### Assignment – 2

### Part – A

1. Define process state?
2. Define IPC?
3. What are the Scheduling Criteria?
4. Differences between a Process and Thread
5. Define deadlock
6. Difference between pre-emptive and non pre-emptive scheduling? (Nov/Dec 2014)
7. What resources are needed when a thread created? (Nov/Dec 2014)
8. Give the structure of semaphore while implementing mutual-exclusion?

### Part – B

1 .i) Draw the state diagram of a process from its creation to termination, including ALL transitions, and briefly elaborate every state and every transitions. (Nov/Dec 2014)

2. i) Explain in detail about the different multi threading models with neat diagram. (Nov/Dec 2014)
Multithreading Models
ii) What is a Deadlock? How does a deadlock occur? How can a system recover from deadlock?

3. Consider the following set of processes, with the length of the CPU-burst time given in milliseconds:

| Process | Burst Time | Priority |
|---|---|---|
| *P*1 | 10 | 3 |
| *P*2 | 1 | 1 |
| *P*3 | 2 | 3 |
| *P*4 | 1 | 4 |
| *P*5 | 5 | 2 |

The processes are assumed to have arrived in the order *P*1, *P*2, *P*3, *P*4, *P*5, all at time 0.
a. Draw four Gantt charts illustrating the execution of these processes using FCFS, SJF, a non preemptive priority (a smaller priority number implies a higher priority), and RR (quantum = 1) scheduling.
b. What is the turnaround time of each process for each of the scheduling algorithms in part a?
c. What is the waiting time of each process for each of the scheduling algorithms in part a?
d. Which of the schedules in part a results in the minimal average waiting time (over all processes)?

4. i)What is the need for process synchronization? Explain critical section problem with a two process.
ii) Demonstrate that monitors and semaphores are equivalent in so far as they can be used to implement the same types of synchronization problems.