Class Test – I **Name: _____**

MCA 2nd Year 1st Semester **Class Roll: _____**

Session: 2015-16

Date: 16/09/2015 **Marks Obtained: _____**

Full Marks: 30

Time: 1 Hour

Write proper justifications for all your answers

1. P_1, P_2, P_3 and P_4 are four processes executing their respective tasks. They should synchronize among themselves using semaphores such that two lines "Sania is great" followed by "Leander is great" are printed infinite times. Determine, minimum number of semaphores required and their initial values. Also identify places where operations on those semaphore should be inserted in the code of P_1, P_2, P_3 and P_4.

```
P1
while(true){
        print("Sania");
}
```

```
P2
while(true){
        print("Leander");
}
```

```
P3
while(true){
        print(" is");
}
```

```
P4
while(true){
        print(" great\n");
}
```

2. Consider the following set of processes with the arrival times and the CPU burst times given in milliseconds

Process	Arrival Time	Burst Time
P_1	0	5
P_2	1	3
P_3	2	3
P_4	3	1
P_5	4	2

Determine the turnaround time and waiting time for all the processes using Shortest Remaining Time First (SRTF) and Longest Remaining Time First (LRTF) scheduling policy. In both the cases ties are broken by giving priority to the process with lowest id.

3. A system has four processes and three allocable resource types. The current allocation and maximum requirements for each process are as follows:

Process	Allocation	Maximum	Available
P_1	0 1 2	0 1 2	1 2 0
P_2	1 0 0	1 5 0	
P_3	1 5 4	2 5 6	
P_4	0 3 2	3 5 2	

Is the system in a safe state? If so, which process will finish last?
In the system state shown in above table, if a request from process P_2 arrives for (0, 2, 0) can the request be granted immediately?

4. What is a "spin lock"? Describe one implementation of semaphore which removes "spin lock".

6+8+12+4=30