Class Test – I **Name: _____**

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

Session: 2013-14

Date: 18/02/2014 **Marks Obtained: _____**

Full Marks: 30

Time: 50 minutes

Write proper justifications for all your answers

1. Ping and Pong are two separate processes executing their respective tasks. They should synchronize among themselves using semaphores such that they forever take turns, alternately printing "ping" and "pong" on the screen. 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 Ping and Pong.

```
Ping(){
        while(true){
                print("ping");
        }
}
```

```
Pong(){
        while(true){
                print("pong");
        }
}
```

   Propose a solution without using semaphores (shared variables may be used).

2. For the following code segment determine how many times "Hello" will be printed.

```
int i=0;
do{
        if(fork()!=0);
                i++;
        else
                i+=2;
}while(i<=3);
printf("Hello");
```

3. A system has four processes and five allocable resource types. The current allocation and maximum needs are as follows:

Process	Allocated	Maximum	Available
P_1	1 0 2 1 1	1 1 2 1 3	0 0 x 1 1
P_2	2 0 1 1 0	2 2 2 1 0	
P_3	1 1 0 1 1	2 1 3 1 1	
P_4	1 1 1 1 0	1 1 2 2 1	

   What is the minimum value of x for which this is a safe state?

4. Consider four processes (process id 0, 1, 2 and 3 respectively) with compute time bursts 2, 8, 6 and 4 time units respectively. All processes arrive at time zero. Consider the longest remaining time first (LRTF) scheduling algorithm. In LRTF ties are broken by giving priority to the process with lowest id. Determine the average turn-around time and average wait time.

(6+3)+8+5+8=30