Roll No. 66

Operating System Tutorial - 5

Q.1 Consider semaphore S, initialized with value 1. with 10 processes. All processes have the same code as given below, one process P10 has signal (s) in place of wait (s). If all process can execute multiple times, then the maximum number of process which can be in critical section together.

```
While (true)
{
    wait(s);
    C.S.
    signal (s);
}
```

―――→

Code for P1, P2, ... P9

```
while (true)
{
    wait(s);
    C.S.
    signal(s);
}
```

Code for P10

```
while (true)
{
    signal(s);
    C.S.
    signal(s);
}
```

All the 10 processes can be in critical section together.

i. Process P1 arrives, it performs the wait operation on semphore and sets it's value to 0. and then enters the critical section

ii. Then process P2, P3, .. P9 arrives and gets blocked and one put to sleep in awaiting list while P1 is executing

iii. Process P10 arrives and performs signal operation.

iv. One process(P2) from waiting list is wakes up and can enter critical section.

v. P10 enters critical section and during exit it perform signal operation again and next process from waiting list (ie. P3) enteeents C.S.

vi. P10 executes repeakedly and wakes up 2 process every execution.

vii. In this manner, all processes get entry inside the C.S.

Q.2 Consider semaphore S initialised with value 1. All process here same code, P10 has signal (s) and wait (s) swapped. If all process can execute only one time, then the maximum number of process which can be in C.S. together?

```
While (true)
{
    wait(s);
    C.S.
    signal(s);
}
```

code for P1, P2, .. P9

code for P10

```
While (true)
{
    Wait(s);
    C.S.
    Signal (s);
}
```

```
While (true)
{
    signal(s);
    C.S.
    wait (s);
}
```

The maximum processes that can be in C.S. together one 3

P1 entires and entirs C.S. rest of P2, P3, ... P9 stays/enter into wasting list

P10 arrives and the one process from waiting list ie. P2 will enter C.S. and after that P10,

In this manner, a process leaves the C.S. , the maximum number present at same time will be 3.