Branch : CSE & IT Batch : Hinglish

Operating System

Process Synchronization/Coordination

DPP 02

[MCQ]

1. Intra Process–communication is_____.

(a) Two processes within same system sharing resources.

(b) Two entities within same process communicating with each other.

(c) Two variables of two processes communicating with each other.

(d) None of these.

[MSQ]

2. In IPC, synchronization is required to eliminate_____.

(a) Inconsistency

(b) Deadlock

(c) Progress

(d) Data-loss

[MCQ]

3. Consider the following statements:

(i) User mode execution is non-atomic.

(ii) User process can be preempted after completion of any instruction.

Which of the following correct?

(a) Only (i) is correct

(b) Only (ii) is correct

(c) Both (i) and (ii) are correct

(d) None of these

[MSQ]

4. Preemption during execution can lead to_____.

(a) Inconsistency

(b) Correct result

(c) Data loss

(d) Incorrect result

[MCQ]

5. Consider the snippet following two processes:

P_1

```
{
    int x;
    int y;
    y = x + 1;
    x + 1;
}
```

P_2

```
{
    int p;
    int y;
    y = p – 1;
    p – 1;
}
```

What is the shared variable in both processes?

(a) x (b) y

(c) p (d) all of these

[MCQ]

6. Critical section is_____.

(a) Part of the program which does not access shared resource.

(b) Complex part of program which cannot be translated by complier.

(c) Such section will always cause deadlock.

(d) Part of the program where shared resources are accessed.

[NAT]

7. Consider the following code of producer consumer problem:

```
# define N 1000
int Buffer [N]
int count = 0
void producer (void)
{
    int itemp, in = 0;
    while (1)
    {
        itemp = Produce_item();
        while (count = = N);
        Buffer[in] = itemp;
        in= (in + 1) % N;
        count = count +1;
    }
```

```
void consumer (void)
{
int itemc, out = 0;
while (1)
{
    while (count = =0);
    itemc = Buffer [out];
    out = (out + 1) % N;
    count  = count – 1;
    process_item(itemc);
}
```

}

How many variables from the above code belong to critical section?

[MSQ]

8. Necessary condition for synchronization problems to occur in Inter–process communication environment are

(a) Critical section

(b) Non-critical section

(c) Race condition

(d) Preemption

Answer Key

1. **(b)**
2. **(a, b, d)**
3. **(c)**
4. **(a, c, d)**
5. **(b)**
6. **(d)**
7. **(2)**
8. **(a, c, d)**

Hint & Solutions

1. (b)
Intra-process communication is when two entities (function) within same process communicating with each other using parameter passing technique or global variable.

2. (a, b, d)
Inconsistency (incorrectness), data-loss, and deadlock can occur in the absence of synchronization.

3. (c)
User mode is non-atomic or preemptive and in user mode processes can get pre-empted after completion of any instruction.
Therefore, option 'c' correct.

4. (a, c, d)
Preemption during the execution of process can lead to inconsistency, data loss and incorrect result.

5. (b)
'y' is the shared variable between P_1 and P_2 as both P_1 and P_2 can modify value of 'y'.

6. (d)
By definition, critical section is a part of the program where shared resources are accessed.

7. (2)
Count and Buffer are two shared variable and belong to critical section.

8. (a, c & d)
Critical section, Race– condition and Preemption (preemptive processes) are necessary condition for occurrence of synchronization problems