Branch : CSE & IT Batch : Hinglish

Operating Systems

Process Synchronization/Coordination

DPP 05

[MCQ]

1. Choose the hardware type solution for the synchronization problem from the following

(a) Lock variables
(b) Strict alteration
(c) Peterson's solution
(d) Test and set instructions

[NAT]

2. Consider the following two-process synchronization solution

X	Y

while (turn = = 1);
C.S
turn =1;
	while (turn = = 1);
	C.S
	turn =1;

The shared variable turn is initialized to zero. Then the number of incorrect statements about above solution is/are?

(I) It violates mutual exclusion.
(II) It violates progress.
(III) It violates bounded wait.

[MSQ]

3. The software type solution: strict alteration satisfies which of the following?

(a) Mutual exclusion
(b) Progress
(c) Bounded wait
(d) All of the above

[MSQ]

4. Choose the correct statements regarding peterson's algorithm from the following

(a) Peterson's algorithm satisfies only mutual exclusion but not progress.
(b) Peterson's algorithm is a solution for 2 processes.
(c) Peterson's algorithm satisfies mutual exclusion, progress and bounded wait.
(d) Peterson's algorithm is a solution for atleast 2 processes.

[MCQ]

5. Which of the following is correct regarding solution to synchronization problem:

(a) Test and set is a 2-process, software based solution.
(b) Lock variable is a 2-process, hardware based solution.
(c) Strict alteration is a 2-process, hardware based solution
(d) None of these.

[MSQ]

6. Choose the characteristics for test and set synchronization solution.

(a) It ensures mutual exclusion.
(b) It is deadlock free.
(c) It does not guarantee bounded wait.
(d) It may cause starvation.

[MCQ]

7. For a implementing synchronization for atleast 2 processes (that should satisfy mutual exclusion, progress and bounded wait), which algorithm is best recommended?

(a) Decker's algorithm
(b) Strict alteration
(c) Peterson's solution
(d) None of the above

[MSQ]

8. Which of the following is/are OS based synchronization mechanism?

(a) Sleep() and wakeup( )
(b) Wait() and signal()
(c) Monitor
(d) Swap

Answer Key

1. **(d)**
2. **(0)**
3. **(a, c)**
4. **(b, c)**
5. **(d)**
6. **(a, b, c, d)**
7. **(d)**
8. **(a, c, d)**

Hints & Solutions

1. (d)

Software type solutions for synchronization problem are lock variables, strict alteration, and peterson's solution.

Hardware type solution is test and set instructions.

2. (0)

The synchronization solution violates mutual exclusion and deadlock may occur.

3. (a, c)

Strict alteration satisfies mutual exclusion and bounded wait but not progress.

4. (b, c)

Peterson's solution satisfies all mutual exclusion, progress, and bounded wait. It is a solution for 2 processes.

5. (d)

Test and set is a hardware based solution while lock variables and strict alteration are software based solution.

6. (a, b, c, d)

All the options, mention the characteristics of the test and set synchronization solution.

7. (d)

Decker's algorithm, strict alteration do not satisfy progress while peterson's solution satisfy all M.E, progress, and bounded wait but it is limited to only two processes.

8. (a, c, d)

Sleep() and wakeup(), wait() and signal(): semaphore, and monitors are OS based synchronization mechanism. Swap is a hardware based synchronization uses lock and key to implement synchronization.