Branch : CSE & IT Batch:Hinglish

Subject : OPERATING SYSTEMS

Topic : System Calls and Threads

DPP 01

[MSQ]

1. Which statements are correct regarding fork() system call?

(a) fork() system call returns a value 1 to the parent process if child process is not created.

(b) fork() system call returns ID of child process to the parent process.

(c) fork() system call returns value 0 to the child process.

(d) None of the above.

[NAT]

2. How many times "GATEWALLAH" is printed by the below given program?

```
int main( )
{
  int a;
  for (a = 0; a ≤ 4; a++)
    {
    fork();
    }
  printf("GATEWALLAH");
  return 0;
}
```

[MCQ]

3. How many processes will be created if below program is executed?

```
int main()
{
int p = 0, q = 0;
fork();
p = fork();
if(p = = 0)
{
q = fork();
}
if(p | | q)
fork();
return 0;
```

(a) 9 (b) 10

(c) 11 (d) 12

[MCQ]

4. Consider the following program with two threads, where initially value of integer counter is initialized to 0:

Thread P	Thread Q

main ()
{
int count a;
count = counter;
for(a = 0; a < 5; a++)
count = count + 1;
}
	main()
	{
	int count b;
	count = counter;
	for(a = 0; a < 5, a++)
	count = count + 1;
	}

Let i be the minimum possible value and j be the maximum possible value of count after the thread gets terminated, then the value of i∗j is _____?

(a) 8 (b) 9

(c) 25 (d) None

[MCQ]

5. Which of the following is incorrect about thread?

(a) Thread management is done by kernel-level threads library.

(b) Thread management is done by user-level threads library.

(c) Flexibility is more in user-level thread.

(d) None of the above.

[MCQ]

6. Which of the following is an advantage of kernel-level thread?

(a) Kernel-level threads are fast.

(b) Kernel-level threads are especially good for applications that get frequently block.

(c) Context switching becomes slow in kernel-level threads.

(d) None of these.

[MSQ]

7. Choose/select the correct statements from the following:

within a process, there may be one or more threads, each with the following:

(a) A thread execution state (Running, Ready, etc.).

(b) A saved thread context when not running one way to view a thread is as an independent program counter operating within a process.

(c) Some per-thread static storage for local variable.

(d) Access to the memory and resources of its process, is not shared with all other threads in that process.

[MCQ]

8. Choose the correct statements from the following about threads.

S_1: By default, an application begins with a single thread and begins running in that thread.

S_2: The application may spawn a new thread to run within the same process. Spawning is done by invoking the spawn utility in the thread's library.

(a) only S_1 is true

(b) Only S_2 is true

(c) Both S_1 and S_2 are true

(d) Both s_1 and S_2 are false.

Answer Key

1. **(a, b, c)**
2. **(16)**
3. **(b)**
4. **(c)**
5. **(a)**
6. **(b)**
7. **(a, b, c)**
8. **(c)**

Hints & Solutions

1. (a, b, c)

When fork() system call is made then there are two possibilities.

(i) creation of child process is successful.

(ii) creation of child process is unsuccessful.

If creation of child process is successful then fork() returns processID to parent process and returns '0', and if creation of child process is unsuccessful then fork() returns negative value i.e., usually -1.

2. (16)

main

|

$2^4-1 = 15$

Totally $15 + 1 = 16$

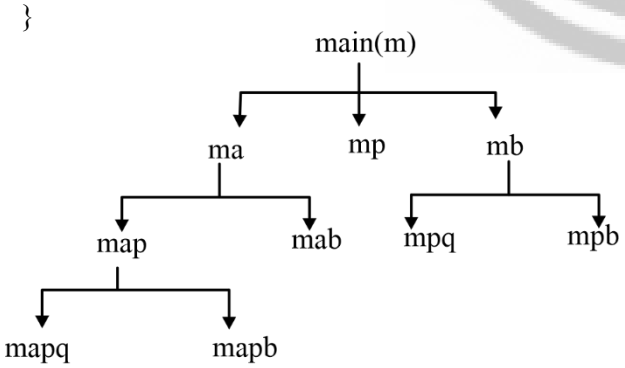
↑

because main function will also print GATEWALLAH

3. (b)

Rewriting the code for better understanding

```
int main( )
{
   int p = 0, q = 0;
   a = fork();
   p = fork();
   if (p = = 0)
      {
      q = fork();
      }
   if(p | | q)
   b = fork();
   return 0;
}
```



4. (c)

As we can see that count is not shared variable between threads. Hence both the threads update the count value to 5. So, sum is 5×5 which is 25.

5. (a)

Thread management is done by user-level threads library.

6. (b)

- Kernel-level threads are slow. It's one of the disadvantage of kernel-level thread.
- Kernel-level threads are good for application, its an advantage of kernel-level thread.

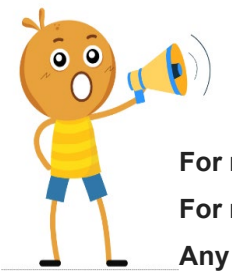
Hence, option (b) is correct.

7. (a, b, c)

Access to the memory and resources of its process, is shared with all other threads in those processes.

8. (c)

- By default, an application begins with a single thread and begins running in that thread.
- The application, may spawn a new thread to run within the same process spawning is done by invoking the spawn utility in the thread library.



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