POSTAL Study Package 2021

Computer Science & IT

Objective Practice Sets

Operating System

Contents

MADE EASY
Publications

1

CHAPTER

Basic Concepts of Operating System

Q.1 Consider the following code:

```
int n = 5;
while (n > 0)
{
      fork () ;
      n--;
}
```

The the total number of child processes created is equal to_______.

Q.2 Consider the following program.

```
main()
{
      for(int i = 0; i < 4; i++)
      {
            fork0;
            fork0;
      }
}
```

The number of child processes created, is equal to__________.

Q.3 The following C program is executed on a Unix/ Linux system.

```
# include <unistd.h>
int main() {
      int i;
      for (i = 1; i <= 50; i++)
            if (i % 2 == 0 | | i % 3 == 0) fork () ;
      return 0;
}
```

Then the number of child processes created is equal to_____________.

Q.4 Consider the following code:

```
#include <unistd.h>
int main()
{
      fork();
      for (i = 1; i <= 5; i++)
      {
            fork();
            printf("*");
      }
      return 0;
}
```

Then the number of times * is printed, is equal to______.

Q.5 Which of the following need not necessarily be saved on a context switch between the processes?

(a) Program Counter

(b) Stack pointer

(c) Translation Lookaside Buffer

(d) General Purpose Registers

Q.6 Which of the following should be allowed only in Kernel mode?

1. Changing mapping from virtual to physical address.
2. Mask and unmask interrupts.
3. Disabling all interrups.
4. Reading status of processor.
5. Reading time of day.

(a) 1, 2 and 3 (b) 1, 2, 4 and 5

(c) 2, 3 and 5 (d) all of these

Q.7 An interrupt handler is a

(a) location in memory that keeps track of recently generated interrupts

(b) peripheral device

(c) utility program

(d) special numeric code that indicates the priority of a request

Q.8 Executing more than one program concurrently by one user on one computer is known as
(a) multiprogramming (b) time-sharing
(c) multitasking (d) multiprocessing

Q.9 The simultaneous processing of two or more programs by multiple processors is
(a) multitasking
(b) multiprogramming
(c) time-sharing
(d) multiprocessing

Q.10 Which of the following does not interrupt a running process?
(a) timer interrupts (b) device
(c) power failure (d) scheduling process

Q.11 System call is used to access
(a) I/O functionality
(b) operating system functionality
(c) application functionality
(d) None of the above

Q.12 Swapping is performed by
(a) long term scheduler
(b) mid term scheduler
(c) short term scheduler
(d) dispatcher

Q.13 Choose the false statement
(a) static linking requires no support of OS
(b) dynamic linking requires no support of OS
(c) dynamic loading requires no support of OS
(d) none of the above

Q.14 Assume that the kernel mode is non-preemptive. What happens when an I/O interrupt comes while a process 'P_1' is running in the kernel mode on the CPU?
(a) CPU is given to the process for which the I/O has completed
(b) CPU is given to some other process based on the scheduling policy
(c) P_1 continues to execute on the CPU
(d) None of the above

Q.15 Overlay is
(a) a part of an operating system
(b) a specific memory location
(c) a single contiguous memory that was used in the olden days for running large programs by swapping
(d) overloading the system with many user files

Q.16 When an interrupt occurs, an operating system
(a) ignores the interrupt
(b) always changes the stage of the interrupted process after processing the interrupt
(c) always resumes execution of the interrupted process after processing the interrupt
(d) may change the state of the interrupted process to "blocked" and schedule another process

Q.17 Consider the following statements:
S_1 : The OS is designed to maximize the resource utilization.
S_2 : The control program manages the system programs.
Which of the above statements is/are true?
(a) S_1 is true S_2 is false
(b) S_2 is true and S_1 is false
(c) Both S_1 and S_2 are true
(d) Both S_1 and S_2 are false

Q.18 Bootstrap loader is always stored in
(a) cache (b) ROM
(c) RAM (d) disk

Q.19 Which of the following is true?
(a) Overlays are used to increase the size of physical memory.
(b) Overlays are used to increase the logical address space.
(c) When overlays are used, the size of a process is not limited to the size of physical memory.
(d) Overlays are used whenever the physical address space is smaller than the logical address space.

2 CHAPTER

Process and Threads

Q.1 Consider n threads T_1, T_2, T_3, ..., T_n of a process P_i. Which of the following cannot be shared between them?

(a) Code (b) Data
(c) Files (d) Stack

Q.2 Consider the following statements:

I. For user level threds, a blocking system call blocks the entire process.

II. For kernel level threads, a blocking system call blocks the entire process.

III. User level threads are transparent to the kernel.

Which of the above statement(s) are true?

(a) Only I, III (b) Only II, III
(c) Only I, II (d) All of the above

Q.3 Which of the following instructions is not privileged?

(a) Clearing Memory Map
(b) Reading time of clock
(c) Disabling Interrupts
(d) Changing memory map

Q.4 Which of the following statements comparing the context of a thread with that of a process is true?

(a) two processes will not share any context; two threads of a same process will only share the data and the code (text) areas of the context

(b) two processes will not share any context; two threads of a same process will share the data, code (text) and the stack areas of the context

(c) two processes will share the data and the code (text) areas of the user context; two threads of a same process will only share the register context

(d) the overhead involved in context switching for threads is much higher than that for processes

Q.5 Which of the following information is not part of process control block

1. Process state 2. List of open files
3. Process page table 4. Stack pointer

(a) only 3 (b) 3 and 4
(c) 2 and 4 (d) None of these

Q.6 Convoy effect is a result of

(a) one long CPU bound process and many other CPU bound processes are waiting
(b) many CPU bound processes and less I/O bound processes
(c) many CPU and I/O bound processes
(d) proper mix of CPU and I/O bound processes

Q.7 In a time-sharing operating system, when the time slot given to a process is completed, the process goes from the RUNNING state to the

(a) BLOCKED state
(b) READY state
(c) SUSPENDED state
(d) TERMINATED state

Q.8 In a multiprogramming environment

(a) the processor executes more than one process at a time
(b) the programs are developed by more than one person
(c) more than one process resides in the memory
(d) a single user can execute many programs at the same time

Q.9 If a system contains n processors and n processes then what will be maximum and minimum processes in running state respectively.

(a) n, n (b) n, 0
(c) n^2, 0 (d) n^2, n^2

Q.17 Which of the following scheduling can be done by thread library?

(a) Process scheduling
(b) User thread scheduling
(c) Kernel thread scheduling
(d) None

Q.18 Match **List-I** and **List-II** and select the correct answer using the codes given below the lists as per the deadlock prevention scheme :

List-I
A. Fork
B. Context switch
C. Degree of multiprogramming
D. Message passing

List-II
1. Inter process communication
2. Process creation
3. Dispatcher
4. Long term scheduler

Codes:

	A	B	C	D
(a)	2	1	4	3
(b)	1	4	3	2
(c)	1	4	2	3
(d)	2	3	4	1

Answers Process and Threads

1. (d)	2. (a)	3. (c)	4. (a)	5. (d)	6. (a)	7. (b)	8. (c)	9. (b)
10. (c)	11. (a)	12. (b)	13. (b)	14. (c)	15. (a)	16. (d)	17. (b)	18. (d)

Explanations Process and Threads

1. (d)

Every threads has to have its own stack, and its own set of registers, and these can't be shared between any two threads. Rest can be shared.

So (d) is the correct answer.

2. (a)

Since user level threads are transparent to the kernel, a blocking system call blocks the entire process, and hence I and III are true. But kernel level threads are not transparent to the kernel, hence II is false.

So (a) is correct.

3. (c)

Clearing Memory Map: Privileged Instruction.

Reading time of clock : Non privileged Instruction.

Disabling Interrupts : Privileged Instruction.

Changing Memory Map: Privileged Instruction.

Hence (c) is correct.

6. (a)

CPU bound processes requires lot of processor time, resulting in long wait for I/O bound processes for the processor. This effect is called convey effect. It results in lower CPU and I/O devices utilization.

9. (b)

When system contains '*n*' processor and '*n*' processes, then maximum number of processes in running state can be '*n*' with each processor containing maximum of one process in the running state. The minimum number is zero with no processor having a process in running state.

Hence correct option (b).

10. (c)

When a process issues an input/output request then it goes from running state to blocked state. When a process terminates itself it goes from running state to terminate state.

A process cannot go to running state after completing its I/O, it most go to ready state.

Hence option (c) is correct.