OS GATE QUESTIONS AND ANSWERS
(INTRODUCTION TO OPERATING SYSTEMS - UNIT 1)

1.Which of the following scheduling algorithm is non preemptive ?

a. Round robin
b. First in first out
c. Multilevel query scheduling
d. Multilevel query scheduling with feedback

Answer : B

2. The maximum number of processes that can be in Ready state for a computer system with n CPUs is

(a) n
(b) n^2
(c) 2n
(d) Independent of n
Answer : D

3. System calls are usually invoked by using

(a) a software interrupt
(b) polling
(c) an indirect jump
(d) a privileged instruction
Answer : A

4. Which of the following actions is/are typically not performed by the operating system when switching context from process A to process B?

(a) Saving current register values and restoring saved register values for process B.
(b) Changing address translation tables.
(e) Swapping out the memory image of process A to the disk.
(d) Invalidating the translation look-aside buffer.
Answer : C,D

5. A processor needs software interrupt to

(a) Test the interrupt system of the processor

(b) Implement co-routines
(c) Obtain system services which need execution of privileged instructions
(d) Return from subroutine
Answer : C

6. A CPU has two modes-privileged and non- privileged. In order to change the mode from privileged to non-privileged
(a) a hardware interrupt is needed
(b) a software interrupt is needed
(c) a privileged instruction (which does not generate an interrupt) is needed
(d) a non-privileged instruction (which does notgenerate an interrupt) is needed
Answer : B

7. Suppose a processor does not have any stack Frohning pointer register. Which of the following statement is true ?
(a) It cannot have subroutine call instruction
(b) It can have subroutine call instruction, but no nested subroutine calls
(c) Nested subroutine calls are possible,but interrupts are not.
(d) All sequences of subroutine calls and also interrupts are possible .
Answer : A

8. When an interrupt occurs, an operating system
(a)ignores the interrupt
(b) always changes state of interrupted process after processing the interrupt
(c) always resumes execution of interrupted process after processing the interrupt
(d) may change state of interrupted process to 'blocked' and schedule another process
Answer : D

9. Which of the following devices should get higher priority in assigning interrupts?
a. Hard disk
b. Printer
c. Keyboard
d. Floppy disk
Answer :C

10. A process executes the code

```
fork();
fork();
fork();
```

The total number of child processes created

a) 3
b) 4
c) 7
d) 8

Answer : 7 is the answer. The number of child process within n-fork() is 2^n-1
i.e $2^3-1 = 7$

11.Which one of the following options guarantee that a computer system will transition from user mode to kernel mode?

A) Function Call
B) malloc Call
C) Page Fault
D) System Call
Answer: D

12. Which of the following standard C library functions will always invoke a system call when executed from a single-threaded process in a UNIX/Linux operating system?

A) exit
B) malloc
C) sleep
D) strlen
Answer: A

13. The following C program is executed on a Unix/Linux system:

```
#include <unistd.h>
int main() {
int i;
for (i = 0; i < 10; i++)
   if (i % 2 0) fork();
return 0;
}
```

The total number of child process created is?

A) 31

B) 63
C) 5
D) 6
Answer: A

14.The following C program:
{
fork(); fork(); printf("yes");
}
If we execute this core segment, how many times the string yes will be printed?
A) Only once
B) 2 times
C) 4 times
D) 8 times
Answer: C

15. What is the output of the following program?
main()
{
int a=10;
if(fork()== 0)
    a++;
printf("%d\n",a);
}
A) 10 and 11
B) 10
C) 11
D) 11 and 11
Answer: A

16.A process executes the code
fork();
fork();
fork();
The total number of child processes created is?
A) 3
B) 4

C) 7
D) 8
Answer: C

17.Fork is
A) the creation of a new job
B) the dispatching of a task
C) increasing the priority of a task
D) the creation of a new process

18. A process executes the following code
```
for (i = 0; i < n; i++)
    fork();
```
The total number of child processes created is
A) n
B) 2^n - 1
C) 2^n
D) 2^(n+1) -1
Answer: B

19. A user level process in Unix traps the signal sent on a Ctrl-C input, and has a signal handling routine that saves appropriate files before terminating the process. When a Ctrl-C input is given to this process, what is the mode in which the signal handling routine executes?
A) User mode
B) Kernel mode
C) Superuser mode
D) Privileged mode

20. System calls are usually invoked by using
A) a software interrupt
B) polling
C) an indirect jump
D) a privileged instruction
Answer: A

21. What is the swap space in the disk used for?
(a) Saving temporary html pages
(b) Saving process data
(c) Storing the super-block
(d) Storing device drivers
Answer : B

22. Increasing the RAM of a computer typically improves performance because:
(a) Virtual memory increases
(b) Larger RAMs are faster
(c) Fewer page faults occur
(d) Fewer segmentation faults occur
Answer : C

23.Which of the following is not a form of memory?
a. Instruction cache
b. Instruction register
c. Instruction opcode
d. Translation look a side buffer
Answer: C

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24. The following two functions P1 and P2 that share a variable B with an initial value of 2 execute concurrently. P1( ) { C = B – 1; B = 2 * C; } P2( ) { D = 2 * B; B = D - 1; } The number of distinct values that B can possibly take after the execution is_____.
Answer: 3

25. 1. Consider the following statements about process state transitions for a system using preemptive scheduling. I. A running process can move to a ready state II. A ready process can move to a ready state III. A blocked process can move to a running state IV. A blocked process can move to a ready state
Answer:C

26.Let the time taken to switch from user mode to kernel mode of execution be T1 while time taken to switch between two user processes be T2. Which of the following is correct?

A. T1>T2
B. T1=T2

C. T1<T2
D. Nothing can be said about the relation between T1 and T2
Answer:C

Time taken to switch two processes is very large as compared to time taken to switch between kernel and user mode of execution because :
When you switch processes, you have to do a context switch, save the PCB of previous process (note that the PCB of a process in Linux has over 95 entries), then save registers and then load the PCB of new process and load its registers etc.
When you switch between kernel and user mode of execution, OS has to just ***change a single bit*** at hardware level which is very fast operation.
So, answer is: (**C**).

27. The following are some events that occur after a device controller issues an interrupt while process L is under execution.
(P) The processor pushes the process status of L onto the control stack.
(Q) The processor finishes the execution of the current instruction.
(R) The processor executes the interrupt service routine.
(S) The processor pops the process status of L from the control stack.
(T) The processor loads the new PC value based on the interrupt.
Which one of the following is the correct order in which the events above occur?
a. QPTRS
b. PTRSQ
c. TRPQS
d. QTPRS
Answer : A

28. Which one of the following is FALSE?
(a) User-level threads are not scheduled by the kernel.
(b) When a user-level thread is blocked, all other threads of its process are blocked.
(c) Context switching between user-level thread is faster than context switching between kernel-level threads.
(d) Kernel level threads cannot share the code segment.
Answer : We know that kernel level threads can share the code segment therefore option (d) is false. Hence the correct option is (d)