

Birla Institute of Technology & Science – Pilani

Hyderabad Campus

1st Semester 2020-2021

Operating Systems (CS F 372) – Test 1 (Regular)

1. Structuring of the operating system by removing all nonessential components from the kernel and implementing them as user level programs that reside in separate address spaces results in ____ kernel
(a) monolithic (b) micro (c) macro (d) hybrid
2. Consider the memory layout of a process which is generally divided into sections such as I – Text Section; II – Data Section; III – Heap Section and IV – Stack Section. Which of the following is a true statement?
(a) sizes of I and II are fixed (b) sizes of II and III are fixed
(c) sizes of III and IV are fixed (d) sizes of I and IV are fixed
3. Consider a multicore environment with 10 cores and the corresponding process state scenario. Assume that 20 processes are in the ready state; 30 processes are in the waiting state. What is the number of running state processes at any instant on any processor core?
(a) 3 (b) 2 (c) 1 (d) 0
4. Let $n = 100$, be the number of processes currently in the memory. Then, the degree of ____ is 100.
(a) multitenancy (b) multithreading (c) multiprogramming (d) multitasking
5. Which of the following is not one of the many events that could occur, once a process is allocated a CPU core and is executing?
(a) The process could issue an I/O request and then be placed in an I/O wait queue
(b) The process could create a new child process and then be placed in a wait queue
(c) The process could be removed forcibly from the core
(d) In case (a), the process eventually switches from wait to running state
6. The split-screen technique, whereby the larger screen on iPad tablets allows running two foreground apps at the same time, is a case of
(a) multitenancy (b) multithreading (c) multiprogramming (d) multitasking
7. Which of the following is **NOT** a true statement regarding `fork()` and `CreateProcess()`?
(a) Both are used to create processes
(b) `fork()` has the child process inheriting the address space of its parent, `CreateProcess()` requires loading a specified program into the address space of the child process
(c) `CreateProcess()` is used in the Linux environment
(d) `fork()` is passed no parameters, `CreateProcess()` expects parameters
8. Which of the following is a right way of implementing a communication link in the message passing paradigm of Inter Process Communication?
(a) direct or indirect (b) synchronous or asynchronous
(c) automatic or explicit buffering (d) all of the above
9. The function `pipe(int fd[])` creates a ____ pipe in UNIX systems.
(a) ordinary (b) named (c) anonymous (d) rendezvous
10. Take the case of the command **ls | less** in Unix systems. The pair of processes represents a ____ scenario.
(a) readers-writers (b) producer-consumer (c) sleeping barber (d) dining philosopher

11. The many-to-one model thread library available for Solaris systems is called ____ threads
 (a) Yellow (b) Red (c) Green (d) Blue
12. Consider the *many-to-one*, *one-to-one* and the *many-to-many* models of user thread - kernel thread mapping. Which of the following is the correct arrangement in terms of the increasing order of the concurrency achieved by them?
 (a) many-to-many; one-to-one; many-to-one
 (b) many-to-one; one-to-one; many-to-many
 (c) one-to-one; many-to-many; many-to-one
 (d) many-to-one; many-to-many; one-to-one
13. If the creation and management of threading is done by compilers and run-time libraries, then it is called
 (a) direct threading (b) implicit threading (c) indirect threading (d) explicit threading
14. The fork-join model of thread creation is often described as a ____ model
 (a) synchronous and explicit/implicit
 (b) asynchronous explicit
 (c) asynchronous implicit
 (d) synchronous implicit
15. The types of dispatch queues used in the Grand Central Dispatch mechanism for iOS operating systems are
 (a) serial & concurrent (b) serial & parallel (c) parallel & concurrent (d) none
16. Consider the fork() and exec() system calls. How many number of threads we need to duplicate if exec() is called immediately after forking?
 (a) 0 (b) 1 (c) all (d) infinite
17. Consider a transaction processing system., where each thread might need its own copy of certain data. Such data is called
 (a) Thread Local Storage (b) local variables (c) global variables (d) external storage
18. The intermediate data structure placed between the user and kernel threads in systems implementing either the many-to-many or the two-level model is called light weight ____
 (a) process (b) thread (c) task (d) transaction
19. Which of the following is not one of the general components of a Windows thread?
 (a) program counter (b) status register set (c) shared storage area (d) thread ID
20. In which of the following cases a new task is created along with a copy of all the associated data structures of the parent process?
 (a) clone() (b) fork() (c) CreateProcess() (d) Create()
21. Consider the following C program named test.c:
- ```
int main(void) {
 int a = 45;

 if (a > 0) return 1;
 else return -1;
}
```

Consider the following commands run at the bash prompt:

1. `$ gcc test.c -o test.out`
2. `$ ./test.out`
3. `echo $?`
4. `echo $?`

The likely outputs from lines 3 and 4 above are respectively:

- (a) -1 ; 1
- (b) 1 ; -1
- (c) 1 ; 0
- (c) 0 ; 0

22. The *cat* command

- (a) Prints the argument to the terminal
- (b) Prints the contents of the argument to the terminal
- (c) Concatenates files
- (d) None of the above

23. Consider the following statements entered on the bash prompt. What is the likely output from line 3?

1. `a=5`
2. `b=6`
3. `echo $a+$b`
- (a) `$a+$b`
- (b) `a+b`
- (c) `11`
- (d) `5+6`

24. Consider the following sequence of statements. `target.txt` initially has 5 lines:

1. `ln target.txt link-1.link`
2. `cp target.txt copy.txt`
3. `ln -s target.txt link-2.link`
4. `echo "123" >> target.txt`
5. `wc -l target.txt`
6. `wc -l link-1.txt`
7. `wc -l copy.txt`
8. `wc -l link-2.txt`

What are the likely outputs from lines 5, 6, 7 and 8?

- (a) 1, 1, 1, 1
- (b) 6, 6, 5, 6
- (c) 6, 6, 6, 6
- (d) 6, 6, 5, 5

25. A file `temp.txt` has the following permission bits: `-rw-r--r--`. The following operation is then conducted:

`chmod 533 temp.txt`

What would the final permission bits for `temp.txt` look like?

- (a) `-r-x-wx-wx`
- (b) `-rw-r--r--`
- (c) `-rwxrw-rw-`
- (d) `-r-xr--r--`

26. If the output of “cat retest.txt” is:

**This is a retest.**

What is the output of “echo | cat -b retest.txt”:

- (a) 1
- (b) This is a retest.
- (c) 1 This is a retest.
- (d) No Output

27. Let us first use a chmod on a file as “chmod 4520 retest.txt” and then type the following on the command window “ls -l retest.txt” to check the file permissions. Which of the following will be correct ?

- (a) It is readable by the owner
- (b) It is readable by the primary group
- (c) It is writeable by everyone else
- (d) None of the above

28. Let us assume you have a file “ostest.c”. How can you remove all the permissions for all the users ?

- (a) chmod o-rwx otest.c
- (b) chmod g+rwx otest.c
- (c) chmod l-rwx otest.c
- (d) chmod a-rwx otest.c

29. To view the inode number, “ls” should be used with which of the following option ?

- (a) -a
- (b) -i
- (c) -n
- (d) -nd

30. To display disk consumption of a specific directory, which command will you use?

- (a) dd
- (b) disk
- (c) du
- (d) dds