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Paper * Operating system

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Section 'A'

1- The hardware mechanism that enables a device to notify CPU is called.

→ interrupt ✓

→ signal

→ Trap

→ Process

2- The section of the control block comprises of page and segment tables

→ Memory related information.

→ Accounting information

→ Register information.

→ Scheduling information. ✓

3- The ---- system call suspends the calling process.

→ fork

→ wait ✓

→ exec

→ exit

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- 4- In addressing, the recipient is not required to name the sender.
- > Symmetric
 - > **Asymmetric** ✓
 - > Both symmetric and asymmetric
 - > None of the given options.

5- ----- Command gives a snapshot of the current process.

- > **Ps** ✓
- > top
- > who
- > is

6- ----- command to resume the execution of suspended job in the foreground.

- > **fg** ✓
- > bg
- > jobs
- > kill

7- You can use the ----- command to display the status of suspended & background process.

- > bg
- > bj
- > jobs ✓
- > kill

8- You can terminate a foreground process by pressing -----

- > <Ctrl-A>
- > <Ctrl-C> ✓
- > <Ctrl-Z>
- > None of the given option.

9- A time sharing system is

- > multi-tasking
- > Interactive
- > Multi-user
- > All of these ✓

10- The main characteristic of Real time system is

- > Efficiency
- > Large virtual Memory
- > Large secondary storage device
- > Usability ✓

11- Shared Libraries and kernel modules are stored in -----.

-> /bin

-> /dev

-> /boot

-> /lib ✓

12- ----- scheduler selects the process from the job pool and put them in main memory.

-> Long term ✓

-> Short term

-> Medium Term

-> Swapper

13- In indirect inter process communication a sender --- mention the name of the recipient.

-> do

-> do not ✓

14- A ----- is an integer variable that, apart from initialization is accessible only through two standard atomic operations: wait and signal.

-> Semaphore ✓

-> Monitor

-> Critical region

-> Critical section

15- A semaphore that cause Busy-waiting is termed as -----

-> Spinlocks ✓

-> Monitor

-> critical region

-> Critical section.

16- The execution of critical section must not be mutually exclusive

-> True

-> False ✓

17- The performance of Round Robin algorithm does not depend heavily on the size of time equlion.

-> True ✓

-> False

18- The following requirement for solving critical section problem is known as -----

"There exists a bound on the number of times that other processes are allowed to enter their critical sections after a process has made a request to enter its critical section and before that request is granted"

- > Progress
- > **Bounded waiting** ✓
- > Mutual Exclusion.
- > Critical Region.

19 The critical section problem can be solved by the following except

- > Software based solution
- > **Firmware based solution** ✓
- > Operating system based solution
- > Hardware based solution.

20- ----- is also called swapper.

-> swap space

-> Medium term scheduler ✓

-> short term scheduler

-> Long term scheduler

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SECTION - B

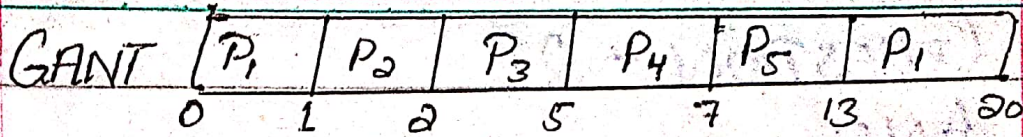
QUESTION - 21

Write the formula/procedure for calculating the waiting time in a preemptive shortest job first scheduling.

ANS:-

Preemptive SJF scheduling is sometimes called shortest remaining-time-first scheduling. We illustrate the working of the SJF algorithm by using the system state.

Process	Arrival Time	Burst Time	Completion Time	T-A-T	Waiting Time (Burst Time) - (T-A-T)
P ₁	0	8	20	20	8 - 20 = -12
P ₂	1	1	2	1	1 - 1 = 0
P ₃	2	3	5	3	0
P ₄	3	2	7	4	2
P ₅	4	6	13	9	3



=> Average T-A-T => $\frac{20 + 1 + 3 + 4 + 9}{5}$

=> $\frac{37}{5} = 7.4$

=> Average waiting Time = $\frac{12 + 0 + 0 + 2 + 3}{5}$

=> $\frac{17}{5} = 3.4$

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QUESTION- 22

If a process exits and there are still threads of that process running will they continue to run?

ANS:-

No, threads of the process will no longer run once the process is terminated. Because all threads in a process share the same address space all threads are suspended at the same time. Similarly a termination of a process terminates all threads within that process.

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ANS:-

Resource sharing have both Advantages of threads and disadvantages of threads.

ADVANTAGES:-

1- Responsiveness:-

Multithreading in an interactive application may allow a program to continue running even if part of its blocked or is performing a lengthy operation, thereby increasing responsiveness to the user.

2- Resource sharing:-

By default, threads share the memory and the resources of the process to which they belong. Code sharing allows an application to have several different threads of activity all within the same address space.

3- Economy:-

Allocating memory and resources for process creation is costly. Alternatively, because threads share resources of the process to which they belong, it is more economical to create and context switch threads.

Disadvantages:-

Some of the main disadvantages of threads are.

1- Resource sharing:

where as resources sharing is one of the major advantage of threads. It is also a disadvantage because proper synchronization is needed between threads for accessing the shared resources (e.g data and file).

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2- Difficult programming model:

It is difficult to write, debug, and maintain multi-threaded programs for an average user. This is particularly true when it comes to writing code for synchronized access to shared resources.

