

OS - 2 marks

① Objectives of OS:

- Make computer system convenient to use in an efficient manner.
- Provide convenient interface to use the computer system.
- Easy to manage.
- Multitasking.

② Components of process control blocks:

- Process state
- Process number
- Program counter
- Register
- Memory limits
- Accounting information
- I/O status information.

③ A multithreaded system consisting of multiple user-level thread mapped to one kernel thread can't use of the different processors in multiprocessor system. Consequently, there is no performance benefit

associated with this solution. The multithreaded solution could be faster if the multiple user-level thread are mapped to different kernel threads.

④ Benefits of thread:

- Responsiveness
- Resource sharing
- Economy
- Scalability.

Challenges of thread:

Identifying tasks

- Balance
- Data spitting
- Data dependency
- Testing and debugging.

⑤ Execution of bootstrap prog:

A bootstrap program is the first code that is executed when the computer system is started. The entire OS depends on the bootstrap program to work correctly as it loads the OS.

⑥ Throughput:

One measure of work is no. of process that are completed per time unit called throughput.

Turn around time:

The interval from time of submission of a process to the time of completion is called turn around time.

CPU Utilization:

It can range from 0 to 100%. In real system, it should range from 40% to 90%.

⑦ Busy waiting:

It is a process synchronization technique in which a process (task) waits and constantly checks for a condition to be satisfied before proceeding with its execution.

⑧ a primitive operation of semaphore:

wait(s) - Denoted (P) → Proberen means test

signal(s) - Denoted (V) → Verhogen means increment.

⑨ Conditions for deadlock:

• Mutual exclusion: At least one process held in non sharable state.

• Hold & wait: A process must be holding atleast 1 resource and waiting for additional resource that is currently being held by other process.

• No-preemption: Resource can't be preempted before the process has complete its task.

• circular wait: Set of waiting process must exist such that P_0 waits for resource held by P_1 , P_1 waits for resource held by P_2 , so on.

⑩ Race condition:

Several process access and manipulate the same data concurrently and outcome of execution depends on the particular order in which the access takes place is called race condition.

⑪ Internal fragmentation

External fragmentation.

⑫ Load time address binding:

If the address is not known at compile time that the process will reside in memory then the compiler must generate relocatable code.

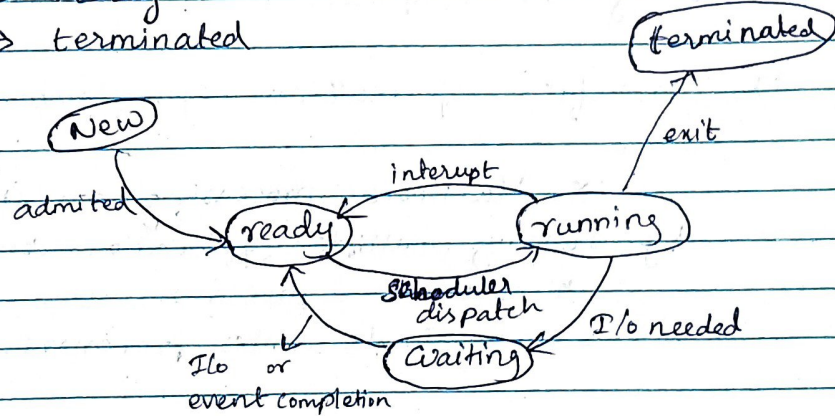
2 Marks

13. Operating system:

An operating system is a program that manages the computer hardware. It also provides the bases for application programs and act as a intermediater between the computer users and the computer hardware.

14. Process State:

- new
- running
- waiting
- ready
- terminated



15. Dual mode operations:

To ensure the proper executing of the OS we must be able to distinguish between the execution of OS mode and user defined mode.

We need to separate mode of operation. User mode and Kernel mode.

16. Working principle of System boot:

1. Power on Self Test (POST):

When the computer is turned on, the basic I/O system performs a series of self test to check the system hardware.

2. Boot loader:

It is responsible for loading the operating system kernel into memory.

3. Kernel Initialization:

After boot loader kernel initializes the system hardware and device drivers.

4. User mode - User can log in and start using the computer.

17. Benefits of multicore programming:

* Multicore processing can increase performance by running multiple application concurrently.

* Multicore processors can finish more work than single center processors.

* Performance

* Reliability

* Software Interactions

* Multitasking

* Power Consumption.

18. Four essential section in process

Synchronization:

- * Entry section
- * Critical section
- * Exit section
- * Remainder section.

19. TAT

WT

* It refers to the time taken by a process since it enters a ready queue for the process of execution till completion

It refers to the total time that a process spends while waiting in a ready queue until it gets the CPU.

* speed of o/p is effective

* speed of o/p is not effective.

$$* TAT = CT - AT$$

$$* WT = TAT - BT.$$

20. Requirsements to solve critical section problem

- * Mutual exclusion
- * Progress
- * Bounded waiting

21. ~~Deadlock can be avoided us~~

21. Deadlock avoidance can be done with Banker's algorithm and Resource allocation graph

- * Banker's algorithm - when resource have multiple instances, we use banker's algorithm
- * Resource allocation graph - is the pictorial view of all allocation resources, available resource and OS current state

22. Logical address Physical address

- | | |
|---|--|
| * Generated by CPU | * Location in memory unit. |
| * User can view the logical address of the program. | * User can never view the physical address of program. |
| * It can be changed. | * It can't be change. |
| * Also called " virtual virtual address" | * It is also called "real address". |

23. External fragmentation:

- * External fragmentation occurs whenever a method of dynamic memory allocation happens to allocate some memory and leave a small amount of unusable memory.
- * The total quantity of the memory available is reduced substantially in case there's too much external fragmentation.