

Operating System :-

:- 2021 :-

past paper

- Solution :-

Objective part :-

i) What are the two main functions of operating system?

i) manage the computer's resources, such as CPU, memory, disk drives and printers.

ii) Establish a user interface.

iii) execute and provide services for application software.

ii) Differentiate b/w internal and external fragmentation?

Internal fragmentation is the area occupied by a process but can't be used by the process. This space is unusable by the system until the process releases the space.

External fragmentation exists when total free memory is enough for the new process.

but it's not contiguous and can't satisfy the request. Storage is fragmented into small holes

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i) Differentiate b/w Symmetric and asymmetric multiprocessing?

A method of processing in which multiple processors work together on the same task is called Symmetric multiprocessing. Each processor runs an identical copy of the same OS.

A multiprocessing technique in which each processor is dedicated to a particular task is called asymmetric multiprocessing. It has one master processor and remainder processors are called Slave.

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v) What is the purpose of System call?

System calls allow user-level processes to request services of the operating system.

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(V) Explain semaphores and write a short note on it?

Semaphores provide a more organized way of controlling the interaction of multiple processes than simple variables. A semaphore is an integer variable used by processes to send signals to other processes. It can only be accessed by the following two operations:

- P (wait or Down)

- V (Signal or up)

The definition of wait is as follows:

wait (S)

```
{  
    while (S <= 0); // do nothing  
} S--;
```

The definition of signal is as follows:

signal (S)

```
{  
    S++;  
}
```



vi) How do you define an interrupt?

An interrupt is a hardware-generated change-of-flow within the system. An interrupt handler deals with the cause of the interrupt. The control is then returned to the interrupted context and instruction.

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vii) How process differs from thread?

Threads:

(i) A thread is a lightweight entity. (ii) A thread can't exist without a process. (iii) A thread has no data segment or heap. (iv) if a thread ends, the process may still run.

Processes:

(i) A process is a heavy weight entity.
(ii) There must be ~~one~~ at least one thread in process.
(iii) A process has code, data and heap segment.
(iv) if a process ends, all threads in it also end.

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viii) what is dispatcher and dispatch latency?

Dispatcher is a program that actually gives control of CPU to a process selected by CPU scheduler. It is another part of the scheduling system.

The time that the dispatcher takes between stopping one process and starting another process is called the dispatch latency.



(ix) what is meant by a system call?

System calls provide an interface between a user program and operating system. The system call exposes the services offered by the OS to user programs. Most system calls are written in assembly language and are machine dependent.



(x) Define the two phase locking?

In database and transaction processing, two-phase locking is a concurrency control method that guarantees serializability. It is also the name of the resulting set of database transaction schedules.

(xi) Define context switch?

Switching the CPU from one process to another process and saving the state of old process and loading the save state for the new process, is called context switch.

(xii) Why does interrupt disable method to achieve mutual exclusion not work for multiprocessor systems? Mutual exclusion means that during some time, a certain piece of code (called a critical section) has exclusive control over a resource. Interrupt can break that because

they cause control to ~~the~~ be transferred from critical section to the interrupt handler.

