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8th Batch

CSE

Course code: CSE231

Course: Operating system concept

Ans: the: Q! No: 01

Basic concept operating system: An operating system with the Allocation of resources & service, such as memory, processors, Device & information. The operating system correspondingly includes programs to manage these resources, such as a traffic controller, a scheduler, a memory management module, I/O programs for file system.

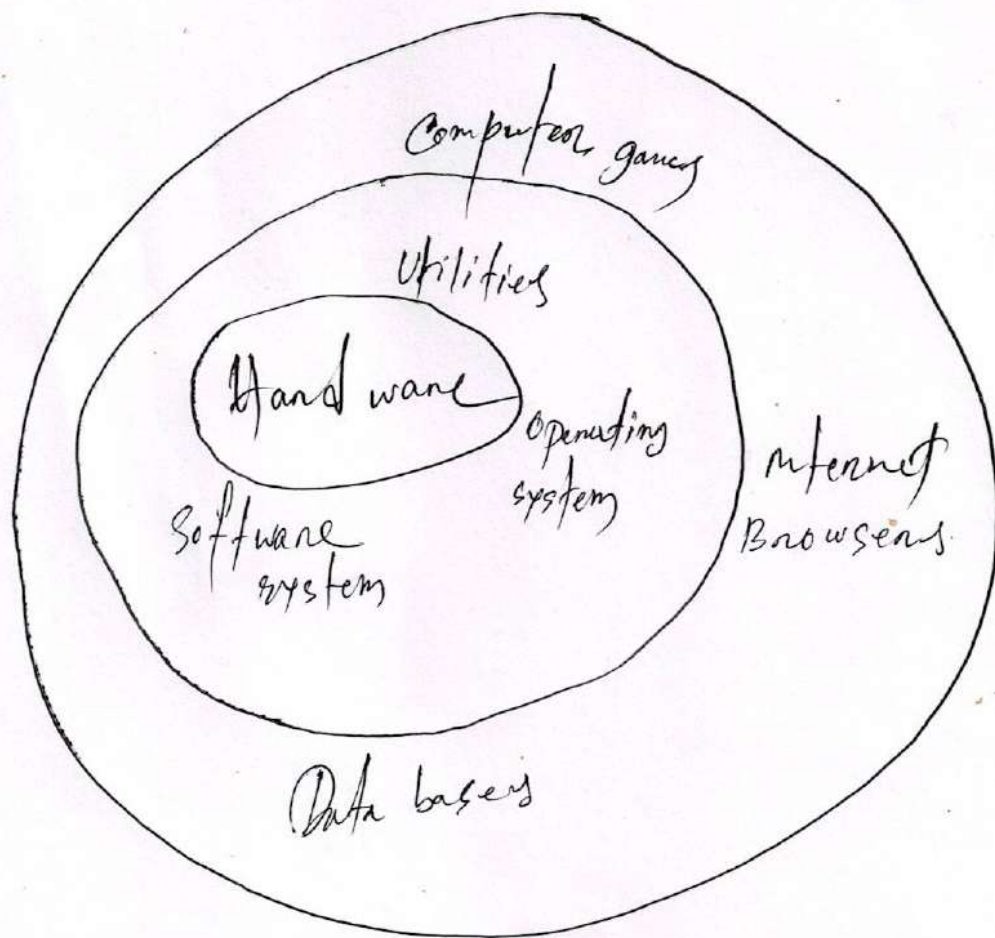
An operating system service as a linker between a computer's software & hardware. Typically example of operating system are windows, linux, mac, os & unix. An operating system is composed of five layers, the kernel, input/output, memory management, file management system & user interface.

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Operating system Definition & Function:

→ In the computer system (comprises of hardware & software), hardware can only understand machine code (in the form of 0 & 1) which doesn't make any sense to a main user.

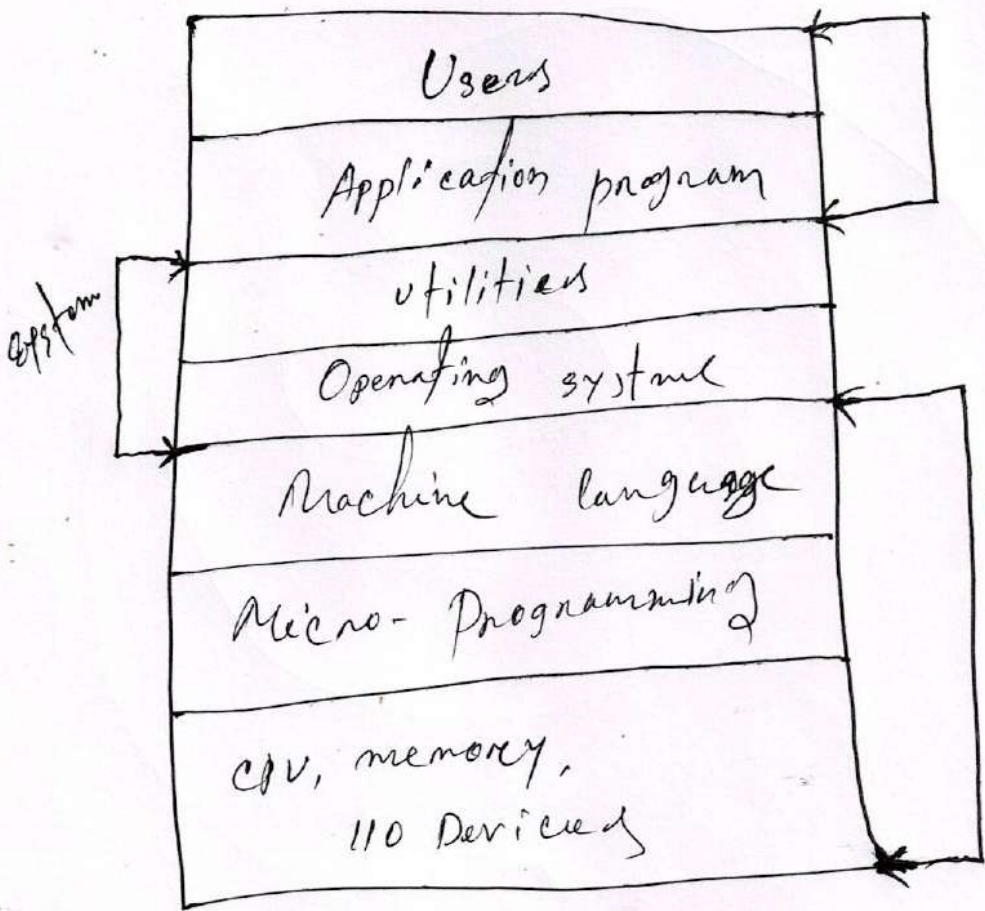
We need a system which can act as an intermediary & manage all the processes & resources present in the system.



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An operating system can be defined as an interface between user & hardware. It is responsible for the execution of all process, resource allocation, CPU management, file management & many other things.

The purpose of an operating system is to provide an environment in which a user can execute program in convenient & efficient manner.



These are various, advantage & Disadvantage of the multi programming Operating system. Some of the advantage & disadvantage are as follows:-

Advantages:

- It provides less response time
- It may help to run various jobs in a single application simultaneously.
- It helps to optimize the total job throughput of the Computer.
- Shorter times jobs are done quickly in comparison to long time jobs.
- It may help to improve turnaround time for shorter time tasks.
- It helps improving CPU utilization & hence its idea.

(5)

Disadvantage Operating system:

- It's highly complicated & sophisticated.
 - The CPU scheduling is required.
 - Memory management is needed in the Operating system because all types of tasks are stored in the main memory.
 - The harder task is to handle all process & tasks.
 - If it has a large number of jobs, then long term jobs will require a long wait.
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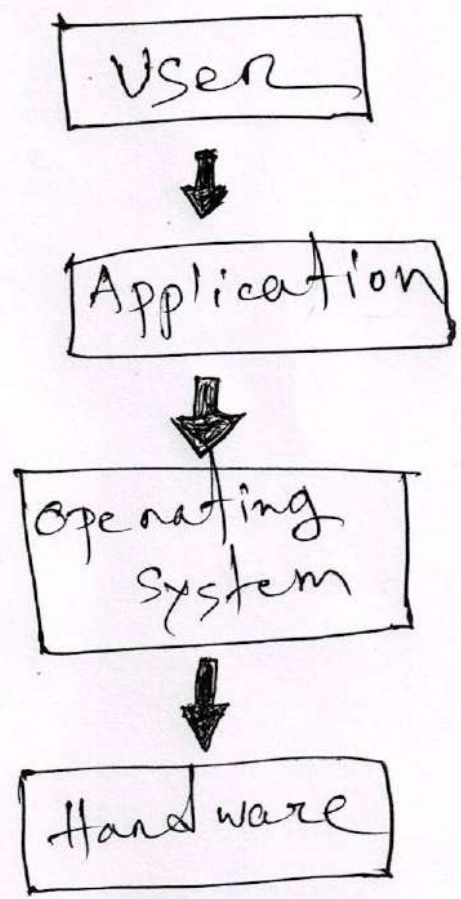
Q: Features of Operating system: (05)

Allows disk access & file system device driver
networking security. Program execution, memory management
virtual memory multitasking.

⇒ Here's list important features of OS:-

- Protected & supervisor mode.
- Allows disk access & file system Device Drivers
networking security.
- Program execution.
- Memory management virtual memory Multitasking.
- Handling I/O operations.
- Manipulation of the file system.
- Error detection & handling.
- Resource allocation.
- Information & resource protection.

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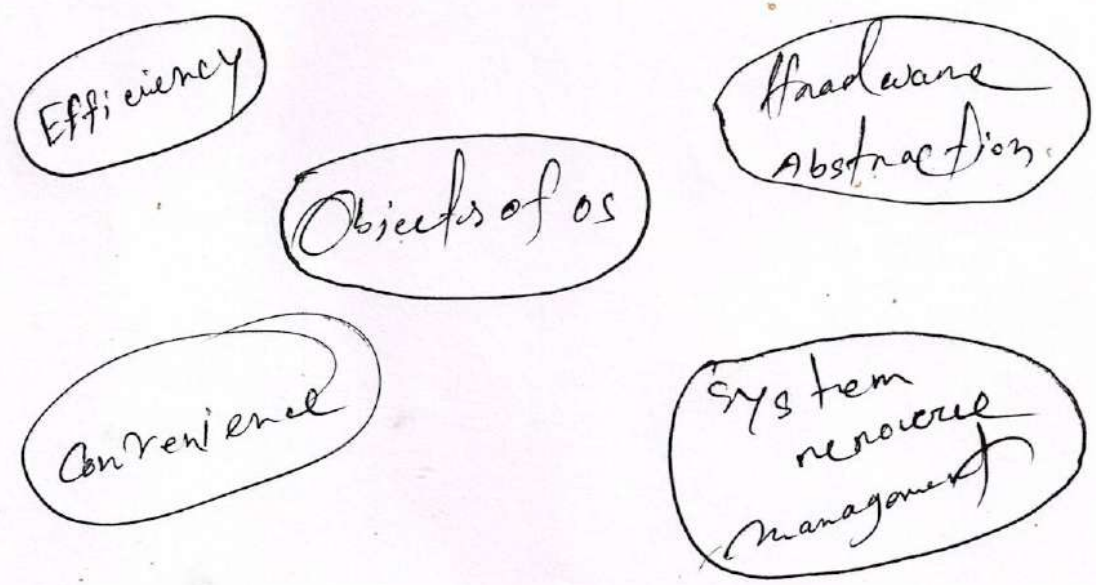
A Feature Operating system.

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Objects Operating system: The Operating system acts as a bridge between the users of a computer system & the computer hardware. All of the Applications required for your program to utilize the computer hardware are located on top of the Operating system.

→ The following are the main objects of Operating system.

- (i) Efficiency.
- (ii) Hardware abstraction.
- (iii) Convenience.
- (iv) System resource management.



⑨

Efficiency: The Operating system increases the production efficiency. This is because the system configuration takes less time. By default the operating system handle system tasks such as allocating resource to process & resolving conflicts between different program & users.

Hardware abstraction:

The Operating system perform a good job of concealing the computers intricate details. The user can fully utilize the computer hardware without having to cope with the accompanying difficulties.

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Convenience: In the absence of an operating system users would have to deal with the hardware directly without access to the pre-configured utility packages.

System resource management: The operating system serves as a mediator. It serves a management role in the computer system by ensuring operation of consumers.

So, far we have discussed the objects of the Operating system let go over the function of operating system.

Ans: The most secure Operating system:-

Choosing a secure system offers a number of significant advantages, particularly in environments where confidentiality, data integrity and security are priorities. Here are some key reasons to opt for a secure Operating system:-

1. Protection against cyber attacks: Secure Operating systems are designed to resist attacks from malware, ransomware and other forms of cyber attack. They are often equipped with advanced security measures such as strong encryption, built-in firewalls and enhanced access controls.
2. Data confidentiality: These systems are ideal for users who handle sensitive or confidential information. They often feature data and communications encryption, ensuring that personal or business information remains private.
3. Regulatory Compliance: For businesses and Organizations, using a secure Operating system can help to comply with data protection regulations such as the GDPR in Europe or HIPAA in the United States.

4. Minimizing the risk of data leakage:

By limited access to sensitive data & recording activities, these systems reduce the risk of internal or external data leaks.

5. Reliability & stability: Secure Operating Systems

are often more stable & reliable, as they are less likely to be affected by malware or security attacks.

6. Advanced user control: These give users more granular control over security settings, allowing customisation to suit their specific needs.

In short, choosing a secure operating system is essential for those who attach particular importance to IT security, data confidentiality & protection against cyber threats. This includes business, governments, not-for-profit organisations & individuals concerned about their personal digital security.

Deadlock Operating System: Deadlock refers to the condition when 2 or more processes are waiting for each other release a resource indefinitely. A process in nature requests a resource first & uses it & finally releases it.

But in deadlock situation, both the processes wait for other process. Let's look at one example to understand it. Say, process A has resource R1, process B has resource R2. If process A requests resource R2 & process B requests Resource R1, at the same time, the deadlock occurs.

Important features of deadlock -

- In deadlock processes get blocked because each process is holding some resource & they are waiting for other resource, which is held by another process.
- Deadlock usually occurs in multiprocessing, time sharing etc.

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• In multiprocessing, many processes share a specific type of mutually exclusion resource known as softlock.

• Time sharing Computers are equipped with a hardware lock which guarantees exclusive access to processes, thus preventing deadlock.

• There is no general solution to avoid soft deadlock.

There are four condition of deadlock.

1. Mutual exclusion.

2. Hold & wait.

3. No preemption.

4. Circular wait.

Deadlock Operating System

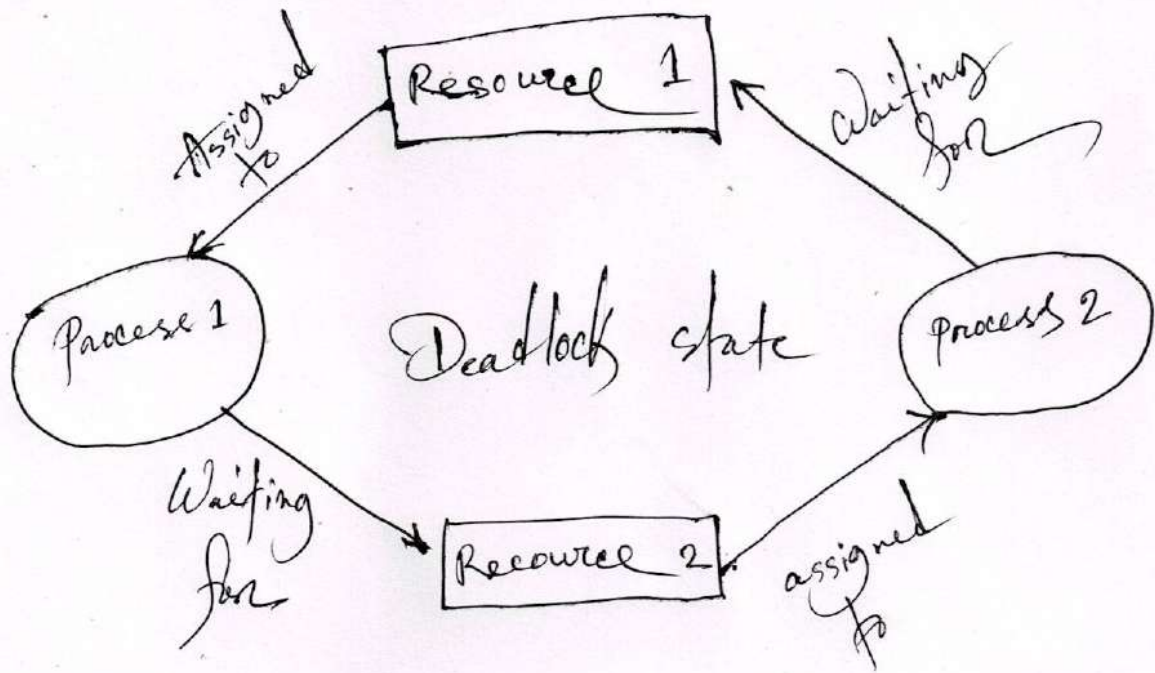


Fig. Deadlock Operating System.