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### **ELECTRONICS ENGINEERING**

# ACE ACADEMY

Topper Handwritten Notes

Computer Engineering

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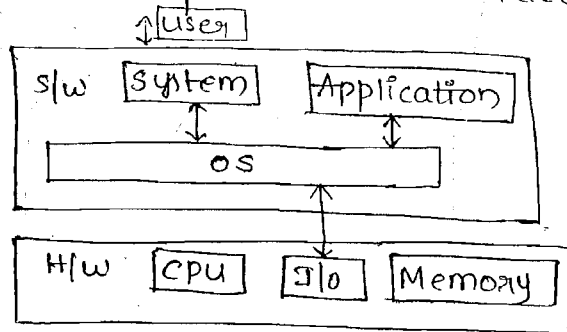
Courier Facility All Over India

(DTDC & INDIA POST)

# 1. OPERATING SYSTEM

\* OS :-

OS is the software which provides interface b/w computer hardware & user.



\* Goal of a good OS :-

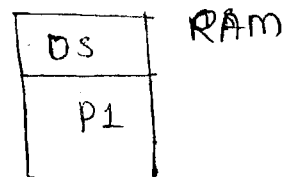
1. Convenience (user friendly) Ex: Windows
2. Efficient (performance)
3. Portability :- OS should run on diff. hardware sets.
4. Scalability :- can add new things
5. Robustness :- if any prblm occurs in OS, PC should not crash.

\* Type of OS :-

1) uni-programming OS :-

→ OS allows only one process in the main memory.

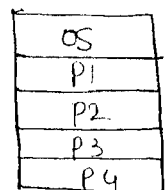
→ If the process goes for I/O execution, then CPU will be idle. Hence CPU utilization is less.



2) multi-programming OS :-

→ This can allow multiple processes in main memory.

→ If one process goes for I/O execution, then other process is available to run on CPU. Hence better CPU utilization.



⇒ No. of processes in the main memory is known as degree of multi-programming.

→ If degree of multi-programming is increased, then CPU utilization increases (but upto a certain limit).

\* Types of multi-programming OS:-

- 1) Non-preemptive
- 2) pre-emptive.

1) Non-pre-emptive:-

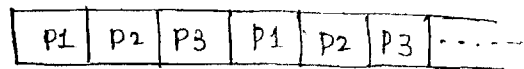
Once a process goes for execution, then it leaves CPU by its own wish (either process completed or going for I/O)

2) pre-emptive:-

If a process goes for execution, it can be taken out from CPU forcefully [Interrupts]

\* Multi-tasking OS:- (Time sharing OS):-

It is an extension of multi-prog. OS in which processes execute in round-robin fashion and switching b/w processes is very fast, so that ~~CPU~~<sup>user</sup> understands that all the processes are running in parallel

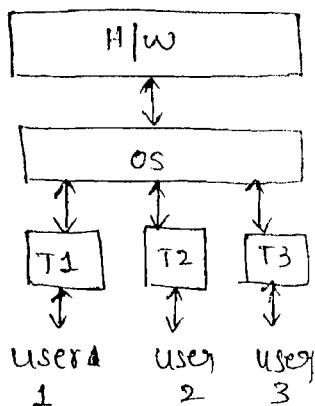


\* CPU time is shared ~~unequally~~ b/w all available processors.

\* Multi-user OS:-

This OS can allow multiple users to use the computer system simultaneously.

\* T1, T2, T3 are terminals [keyboard, mouse, display unit].



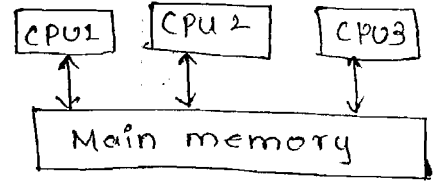
### \* Multi-processing OS:-

This OS needed on a machine, which has multiple CPU's

- ⇒ 1) Tightly bound / shared memory.
- 2) Loosely bound / distributed OS.

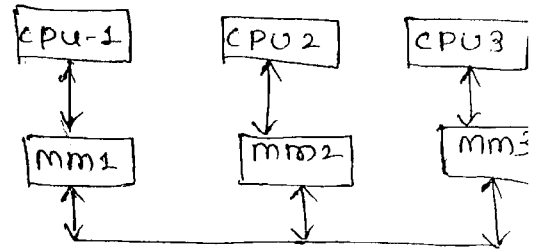
#### 1) Tightly bound:-

- only one main memory.
- No. of CPU's



#### 2) Loosely bound:-

- No. of CPU's & main memories.
- Distributed OS.



### \* Real-time OS:-

Ex: ATM. If we didn't enter PIN,

→ This OS runs on a machine which has real time data to process.

→ In this OS, every process has deadlines.

→ The process should execute within deadline time.

- 1) Hard real time OS [If prcs not done in deadl it stops Imdtly].
- 2) Soft real time OS [Opp. to hard], → not Imdtly.

### \* Embedded OS:-

Embedded system is an expert system attached with mechanical machines to make those machines intelligent.

This sys. includes hardware [process, memory] and the prog's for the interaction b/w mechanical machine & processor.

→ This set of prog's is known as embedded OS.

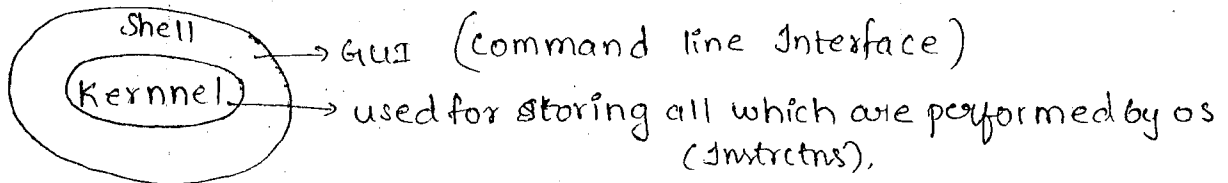
→ Interaction of user with embedded OS is 'Very less'.

### \* Hand-held os:-

os running on hand-held devices like mobiles, tablets etc.,

Ex: Android, iOS etc.,

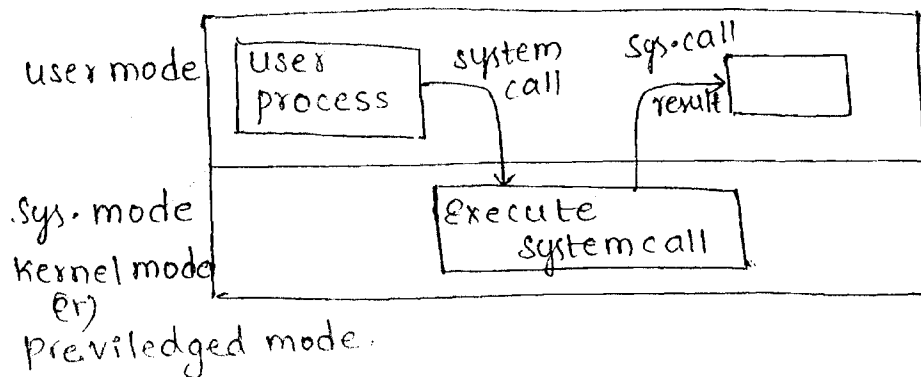
### \* Parts of os:-



### \* Services of os:-

- 1) user Interface
- 2) Prog. execution.
- 3) I/O operations
- 4) Resource management
- 5) file-system manipulation
- 6) Interprocess comctn.
- 7) Error detection.
- 8) protection & security

### \* Dual mode of oprtn:-



\*\*\* Dynamic libraries are not need in os

\* process which has just terminated but has to get relinquish its resource called as "zombie process."