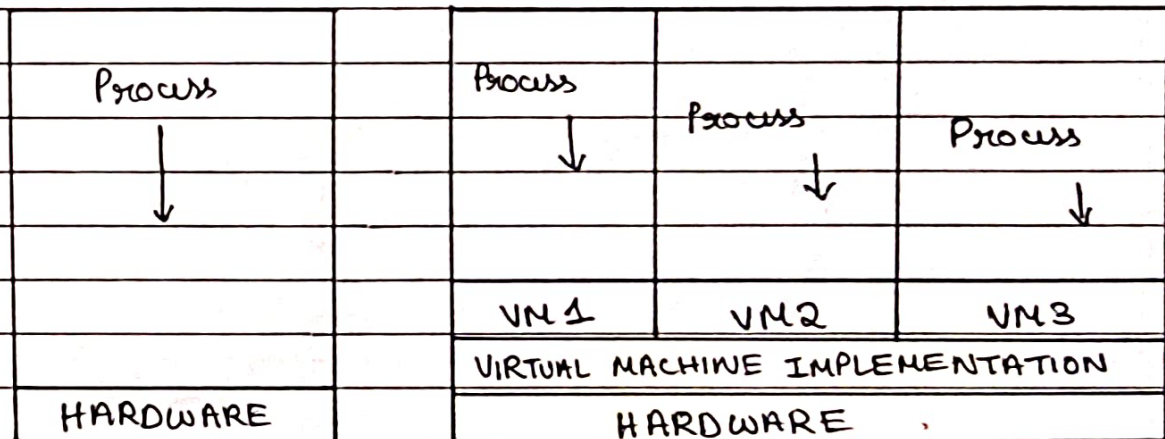


2C303 66

D	D	M	M	Y	Y	Y	Y

Test - 12> a> Virtual Machine

The fundamental idea of a virtual machine is to abstract the hardware of a single computer (CPU, memory, hard disk etc.) to several different execution environments. It basically creates an illusion in which the process thinks it has its own processor and own memory. The host operating system is the main operating system installed and the other operating systems installed are called the guest operating systems.

⇒ Benefits :-

- The main benefit of the VM (Virtual Machine) is able to share
- The host operating system is protected from the virtual machines and the virtual machines are protected from

one another.

- If there is a virus in the guest OS, it only corrupts that operating system and not the other guest operating systems or the host operating systems.
- Even though virtual machines are apart, they can still share resources amongst them.

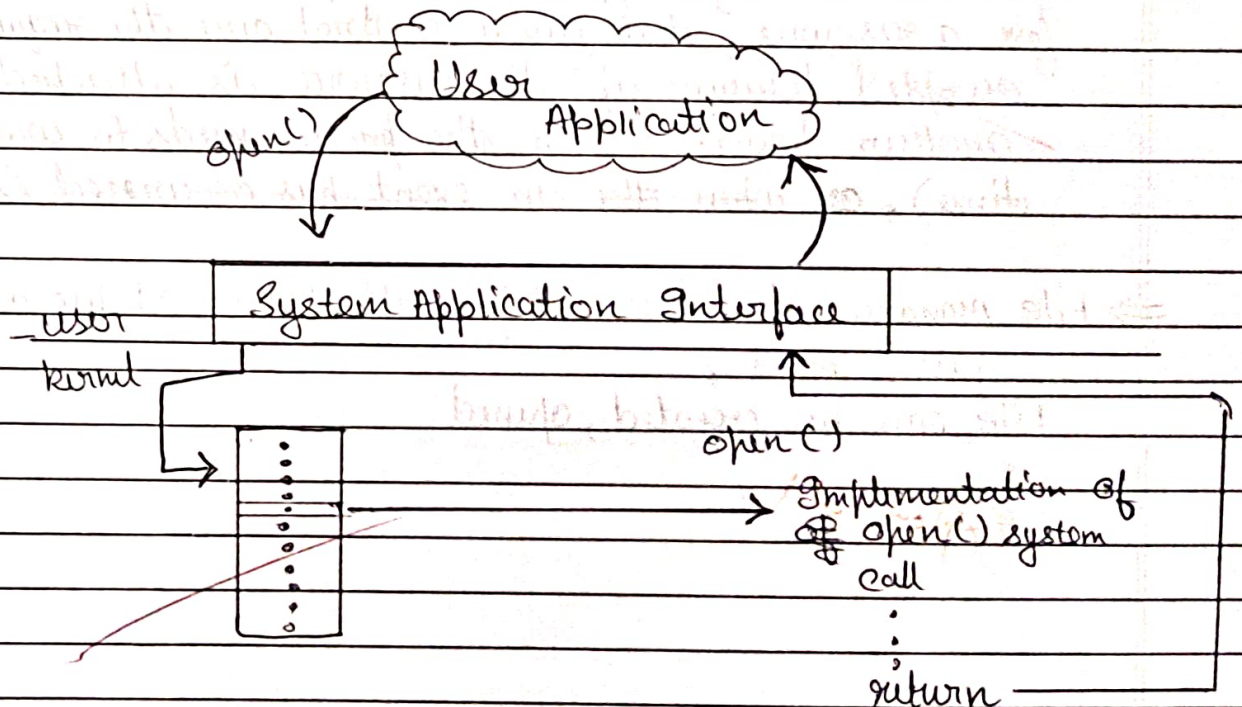
Examples of Virtual Machines are - VMware and JVM (Java Virtual Machine)

VMware - VMware is a popular commercial application. VMware is a user application that runs on any host operating system like windows or linux.



2) b) System calls are means to access the services of the operating systems.

- They are usually written in C, C++ although, some are written in assembly for optimal performance.
- Programmers usually don't use the ~~down-level~~ down-level system calls instead they use API (Application Programming Interface). The API does not use the direct system calls directly but provides for better portability.
- ~~The API can access the system call~~
- The system call is accessed through the system application interface, in which where the system call table contains the specific numbered system call.
- Each system has it's own specific numbered system call.



## Types of System calls

- Process control
- File management
- Device management
- Information management
- Communications
- Protection

⇒ Process control - Process control has or contains end, about, create process, terminate process, get process attributes, set process attributes, wait time, signal <sup>event</sup>, ~~time~~. A process needs to be created, launched, paused, resumed and eventually stopped. When a process makes a request for a resource, it is given control once the request is accepted, however if the resource is attached to another process then the process needs to wait (wait time) or when an event has occurred (signal).

⇒ File management - has set file attributes, get file attributes, open, read. File can be created, opened.

Explain all.



## Module-2

4) a)

Process	AT	BT	Priority	CT	TAT	WT	
P1	0	9	3	9	0	<del>10</del> -9	
P2	1	4	2	13	12	8	
P3	2	9	1	22	20	11	
P4	3	5	4	27	24	19	

→ FCFS

Grantt chart

P1	P2	P3	P4
0	9	13	22 27

→  $TAT = CT - AT$       →  $WT = TAT - BT$

→ Priority (preemptive)

Process	AT	BT	Priority	CT	TAT	WT
P1	0	9	3	22	22	13
P2	1	4	2	13	12	8
P3	2	9	1	9	7	-2
P4	3	5	4	27	24	21

Grantt	P <sub>3</sub>	P <sub>3</sub>	P <sub>3</sub>	P <sub>3</sub>	P <sub>3</sub>	P <sub>3</sub>	P <sub>3</sub>	P <sub>3</sub>	P <sub>3</sub>	P <sub>2</sub>	P <sub>2</sub>		
chart	0	1	2	3	4	5	6	7	8	9	10	11	
	P <sub>2</sub>	P <sub>2</sub>	P <sub>1</sub>	P <sub>1</sub>	P <sub>1</sub>	P <sub>1</sub>	P <sub>1</sub>	P <sub>1</sub>	P <sub>1</sub>	P <sub>1</sub>	P <sub>1</sub>	P <sub>4</sub>	
	11	12	13	14	15	16	17	18	19	20	21	22	23

DDMMYY

1P4 P4 P4 P4  
23 24 25 26 27

### Quiz

1) a) ✓

2) (b) ✗

3) (b) ✓

4) (b) ✓

5) (b) ✓