## Test 01

**1 a)** Operating System :-

It is a system software where it acts as the interface between the user and and the computer hardware. It provides an environment for the execution of system calls. programs in the computer.

Services of operating System

There are many services provided by the operating system in the computer. where some are mentioned as below :-

1) Process Creating
2) Input output device
3) Communication between the user interferance
4) User Interface
5) File manipulation
6) Device management
7) Protection
8) Time management
9) Resource management
10) Error handling
11)

There are some of the services provided by the OS.
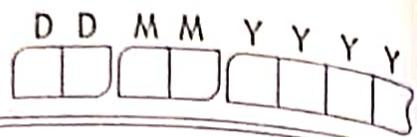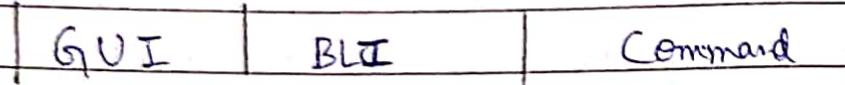
## Diagram of Operating system

### User Interface

| GUI | BLI | Command |
|-----|-----|---------|

### System Calls

| Process creation | Device management | Error handling |
|------------------|-------------------|----------------|
| Resource allocation | Communication | Input / Output |
| Time management | (Services) | Protection |

### Operating System

### Hardware.

Each services provides an different variety of advantage to the process.

1) Process creation: In order to access the data in OS there are some methods of accessing through system calls in which we have interface to communicate with it

Types of Interface

1) Graphic user Interface (GUI
2) Command line Interface
3) Batch line Interface.

By using command line one can access the direct data which they are in need of.
* By give direct command on the computer they can satisfy their need.

GUI :- where as in this it provides a medium of screen, where mouse pointer helps in accessing one required process
* the mouse points the logo, menu, instructions etc.

2) Resource allocation :-
When a system is multiprogramming in need to give the data to each of its data to to the guest OS.
* Hence it place an major role in it.

**\* Communication**

→ Communication b/w the 2 process it can between 2 inter process @ between one process of one system to other

→ Inter communication process plays a major role in it where it has 2 types → Shared memory
→ message passing.

→ Both helps in transfering data from one process to other,

**\* Input/output devices**

→ Each computer will contains many input and output device to correlate its job.

→ Where an input device like keyboard, Joystick, etc helps in feed the information to the system

→ output device helps in decoding, printer, all plays a major role in executing whatever the request got from the OS.

**Error handling**

→ The system should know how to handle the Error during when it occurs.

→ There migh be many kind of errors in the Computer. it can be memory error, system error.

→ With the help of system calls it over comes

**Protection**
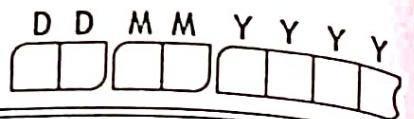
→ There is some protection need to taken from the end of user, in the form of password

| (b)  (i)  Multiprocessor | Clustered System |
|---|---|
| → The multiprocess system are in close communication | → Clustered systems are joined together from pheripheral device. |
| → It requires less cost | → It requires more cost to deploy |
| → It is considered as low available because even if one device gets affected it affects whole process | → It is considered as high availabi-lity because even after one device or more gets interupted or damaged it doesn't affect the architure of the whole process |
| → When in local | → uses in SAN (Storage acess Network) |
| → ~~They should~~ | |
| → The memory shared in this process is stored in the Bus. | → The memory stored in this is stored in LAN. |
| → It is based on process system | → It is based on network system |

Gitam

| (i) Multiprograming | (ii) Multitasking |
|---|---|
| → Multiprograming is the execution process concurrently in a single process | → It is the execution of one - or more program in system in a unit of time |
| → The main aim of multiprograming is to keep the CPU in busy mode | → It main aim is to execute more number of program in a given time |
| → It doesnot like to keep the CPU in idle state, so it keeps on gives the programs concurrently to the system | → It always uses not just one CPU but also it access many CPU to perform the task of device |
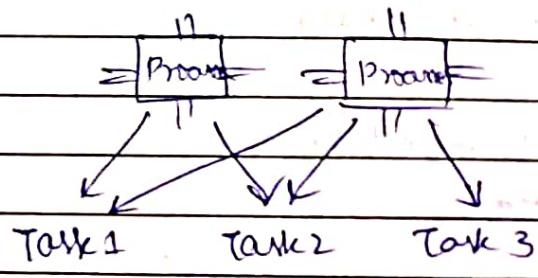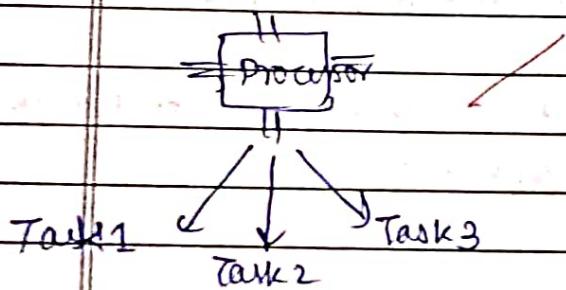
Task1 — Processor — Task3 / Task2

Prog — Prog / Task1 Task2 Task3

| → It is very time consuming | → It is less time consuming |
| → It completes tasks one after one | → It completes tasks very rapidly |

→

, It is the communication b/w 2 process of

**3(a)** Inter-Process Communication:

It is a type of communication in which two process unportant in order to exchange the information from one to other with the help of system call inside the memory region of computer.
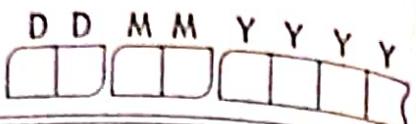
There are mainly 2 types of IPC

① message passing
② Shared memory
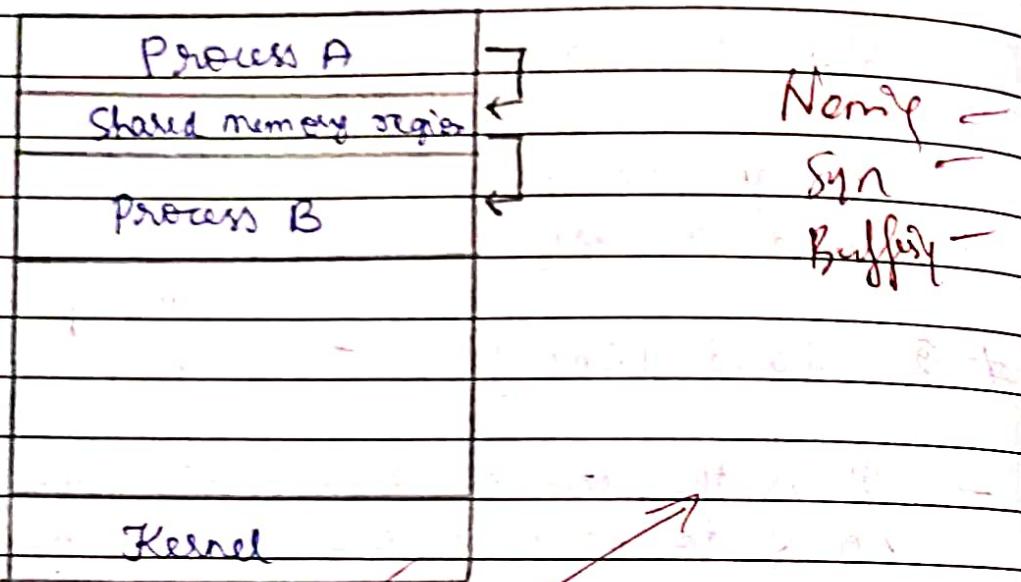
**# ② Shared memory**

→ It is the process of exchange of information from one process to other through system calls.

→ system calls eases the process of accessing data/info in the computer

→ shared memory creates a shared memory region inside its memory region after one process

→ It sends its information from one to the shared region where it next access from the next process present in it.

\* If the process is required the same data then that process is kept one after the shared memory region.

\* For bulk transfering of data it is useful.

- It is more efficient compared to message passing because it uses very less message passing calls.

- It ~message passing~ calls only during the creation of shared memory region.

```
+-----------------------------+
|        Process A            |
|  Shared memory region       |
|                             |
|        Process B            |
|                             |
|                             |
|                             |
|                             |
|        Kernel               |
+-----------------------------+
```

Nonig —
Syn —
Buffer —
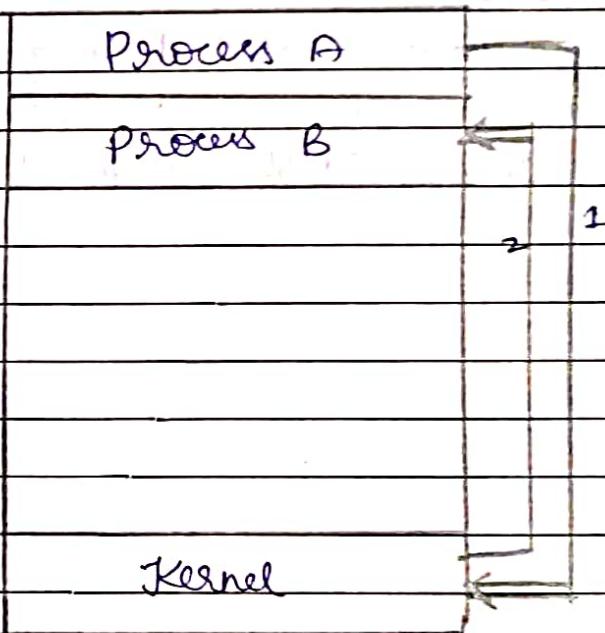
(Fig) Shared memory

- In the above figure the process calls kernel during the creation of the shared memory region once it is created the procan continues.

- Process A sends the required data to shared memory region, after some time when the Process B is in need of same resource it transfers it into the Process B.

- Hence this method eases the communication b/w the processes.

(b) message passing.

→ In this type of communication two processes interact with the help of kernel.

→ It sends whatever the data need to be send to the next process firstly to the kernel then after the stored data is then passed/moved on to the next process which is in need.

→

| Process A |
|---|
| Process B |
| |
| |
| |
| |
| |
| Kernel |

Here both process A & B are placed together but still it doesnot send the data directly into it

instead of that Process A transfer data to kernel then after kernel transfers data to the targeted process which is Process B here.

In order to transfer the data Processor uses system calls to the kernel

* In the above figure 1st link from Procen A to kernel is the System call to kernel Just like that 2nd one also.

* It is used when small block of the information is need to be transferred.

* It is time consuming process compared to that of the shared message.

* It uses many system calls during transferring of the data from one place to the other.
here it is less available compared to shared memory.

**3(b)** multi - threading model

→ threads are the a small segment of process

→ In order to ease or robust the process we use threads.

→ for process it performs one function but this multithreading mode performs more function at a time.

→ It is more efficient in terms of work.
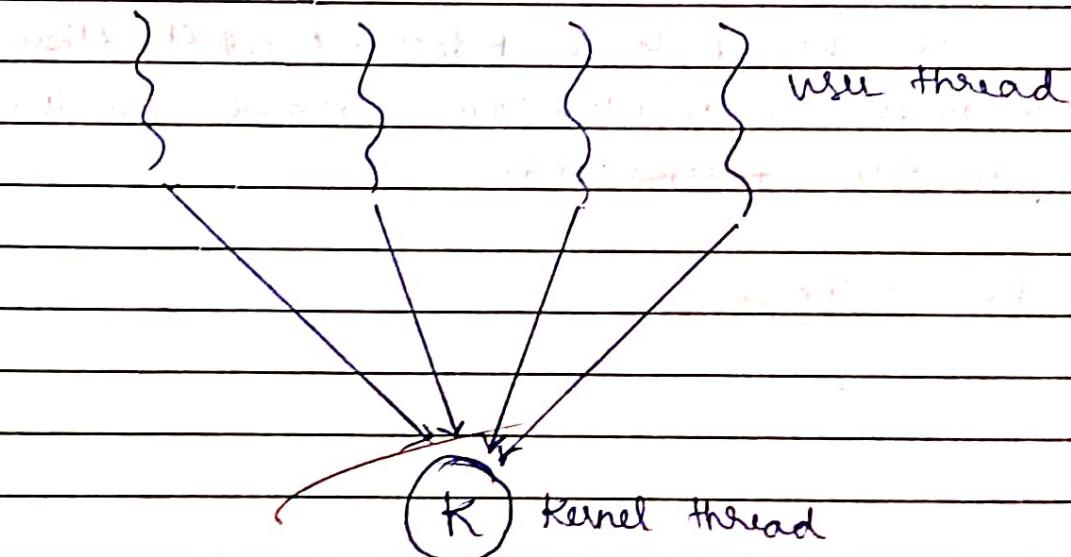
There are basically 3 multithreading models in the operating system they are :
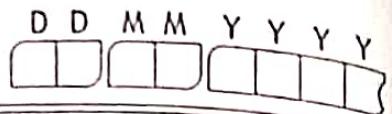
① many to one mode
② one to one mode
③ many to many mode

where it is the interaction b/w user thread & kernel thread.

① many to one mode

Here many user threads are directed to one kernel thread

user thread
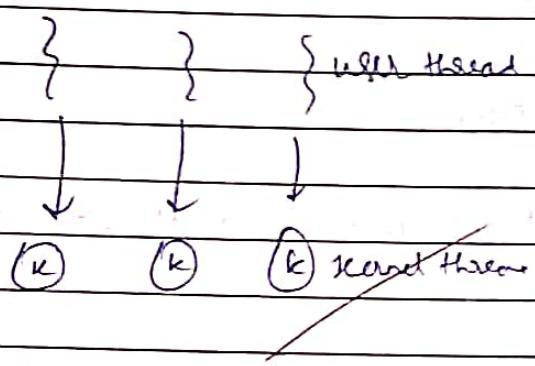
(K) Kernel thread

In this mode even if one thread block also the whole process of the gile affected.

\* Each mode cannot access the kernel at a time. Each mode need to access one after the other.

✗ In order to over come this process some other process modes are created.

2) One - to - one mode



}  }  } user thread
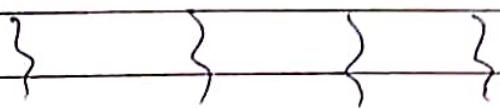
Ⓚ  Ⓚ  Ⓚ kernel thread

Each threads are directly pointed to the respective kernel of interest.

' Even if one thread block it does not affect others.

9 It overcomes the disadvantage formed in the many to one inter mode.
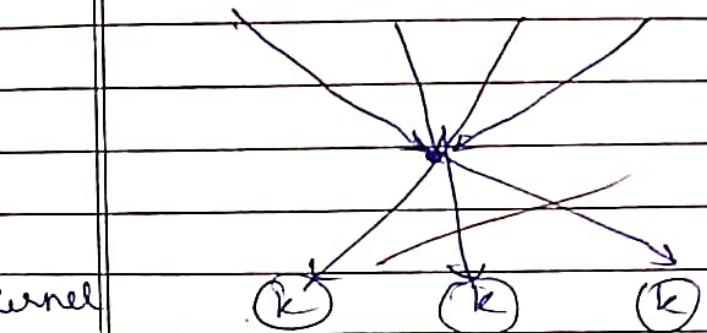
eg:- Window & linux

3) many to many

In this mode more number of threads are connected to equal or small number of kernels.

{        }        }        }

⊗ In this process even if one thread affects the process then it does not affect the system.

K        K        K

\* Always threads are more in number or equal to kernel.

Quiz

1. ⓐ

2. ⓔ a

3. ⓑ

④ b

⑤ ⓑ