

# **Department of Computer Science**

## *Gujarat University*



## *Certificate*

Roll No: 30

Seat No: \_\_\_\_\_

This is to certify that Mr./Ms. Rathod Ajinkya Sreekant student of MCA Semester – III has duly completed his/her term work for the semester ending in December 2020, in the subject of \_\_\_\_\_ Operating Systems (OS) towards partial fulfillment of his/her Degree of Masters in Computer Applications.

Date of Submission  
10 - December - 2020

Internal Faculty

Head of Department

Department Of Computer Science  
Rollwala Computer Centre  
Gujarat University

MCA - III

## **Subject:** - Operating System

**Name:** - Ajinkya Rathod

**Roll No.: - 30**

**Exam Seat No.: - 10029**



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Name: Ajinkya Rathod

Class: MCA III

Subject: OS

## \* Access Method

The method is used to find a file, a record or a set of records.

## \* Address Space

The range of address available to a computer program.

## \* Application Programming Interface

A standardized library of programming tools used by software developers to write applications that are compatible with a specific operating system are graphical user interface.

## \* Asynchronous Operation

An operation that occurs without a regular or predictable time

relationship to a specified event.

For Example, the calling of an error diagnostic routine may receive control at any time during the execution of a computer program.

\* Base Address

An address that is used as the origin in calculation of address in execution of computer program.

\* Batch Processing

Pertaining to the technique of executing a set of common programs such that each is completed before the next program of set is started.



## \* Binary Semaphore

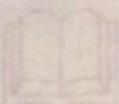
A semaphore that takes only values 0 and 1. A binary semaphore allows only one process or thread to have access to a shared critical resource at a time.

## \* Block

- 1) A collection of contiguous records that as a unit, if the units are separated by "interblock gap".
- 2) A group of bits that are transmitted as a unit.

## \* B-Tree

A technique of organizing indexes. In order to keep each tree to a minimum, it stores the data keeps in a balanced hierarchy that continuously realizes itself as insertions are inserted and deleted. Thus, all nodes always have a



similar nos of loops

\* By Sy waiting

The repeated execution of a loop of code while waiting for an event to occur.

\* Cache memory

A memory that is smaller and faster than main memory. And part is imposed between processor and main memory.

\* Central Processing Unit (CPU)

That follows portion of program that and executes instructions.

It consists of an Arithmetic and logic unit (ALU)



### \* Client

A process that requests services by sending messages to server processes.

### \* Cluster

A group of interconnected, whole computers working together as a unified computing resource, they can create the illusion of being one machine.

The term whole computer means a system that can run on its own apart from cluster.

### \* Communication Architecture

The hardware and software subset that implements the communication function.

## \* Concurrent

Pertaining to processes or threads that take place within a common interval of time during which they may have to alternately share common resources.

## \* Concurrent Resource

A resource that can be created (produced) and destroyed. When resource is acquired by a process, the resource ceases to exist.

Example of corosync, resources all interrupt, signal, messages and inspection into buffer.

## \* Database

A collection of intellectual & data, often with controlled



redundancy, organized according to a schema to suit one or more application, the data are stored. So, not common is used add new data and neither retrieve existing data.

#### \* Deadlock

An impasse that occurs when multiple processes are waiting for availability of resource that are not become available it is being held by another process that is in similar wait state.

#### \* Deadlock Avoidance

A dynamic technique that examines each new resource request for deadlock. If new request could lead to deadlock, then request is denied.



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## \* Device Driver

An OS module that deals directly with a device or I/O module.

## \* Direct Access

The capability to obtain data from a storage device in a sequence independent of their relative position. by means of address that indicate the physical location of data

## \* DMF

A form of I/O in which a special module, called a DMF module, controls the exchange of data between main memory and an I/O device.



## \* Disabled Interrupt

A condition, usually created by OS, during which processor ignore interrupt signals of a specified device.

## \* Disk Allocation Table

A table that indicates when blocks on secondary storage are free and available for allocator of jobs.

## \* Disk Cache

A buffer, usually kept in main memory that functions as cache of disk between disk memory and rest of main memory.

## \* Dispatch

To allocate time on processor to jobs or tasks are ready for execution



## \* Distributed OS

A computer system shared by a network of computers.

The distributed OS provides support for inter process communication, process migration, mutual exclusion and死锁 prevention and detection of deadlock.

## \* Dynamic Relocation

A program first assigns new absolute address to a complete program during execution so that the program may be executed from different area of main storage.



★

## Enabled Interrupt

A condition, usually created by OS during which processor will respond to interrupt request signals of a specific class.

★

## Encryption

The conversion of plain text or data into unreadable form by near or reverse mathematical computation.

★

## External Fragmentation

Occurs when memory is divided into variable size will occur after the occupied partition of memory.

★

## Field

→ Projected logical data not as a logical record.

## \* File

To A set of related records treated as a unit.

## \* FAT

A table that indicate the physical location on Secondary storage of a space allocated to a file. This is one file allocation table for each file.

## \* File Management System

A set of system software not providing user interface and applications in use of files, including file occur.



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## \* File Organization

The physical order of records in a file.. as determined by access method used and retrieve them.

### \* FIFO

Accessing technique in which the next item to be retrieved is an item that has been in the queue for the longest time

### \* Flame

In page virtual, storage, a fixed length block of main memory that is held for one page of virtual memory.

### \* Cog Scheduling

The scheduling of a set of related threads over a set of processors at same time or one-for-one



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## \* Hash File

A file in which records are accessed according to the values of key field. Hash is used to locate a record on basis of its key value.

## \* Mashing

The solution of storage location problem is based on calculating the address as function of contents of data.

## \* Hit Ratio

In a two level memory the fraction of all memory access that are found in faster memory.

## \* Indexed Access



Putting to the org. and acce.,  
of records of a store structure.  
then at seprate place the  
locations of the stored records.

\* Indexed file

A file in which records are  
accessed according to value of  
key fields.

\* Indexed Sequential Access

Refers to the organization and  
accessing of the records of  
store structure through an  
index of the keys that are  
stored in sequentially partitioned  
sequential files.

\* Light weight Process

A thread.

\* Madam Kent

A large Os can fit phasers  
a wide range of services.

\* Mail Box

A data store should carry a  
no. of phasers that is used as  
far as message are sent to mailbox  
and entries for passing messages  
from sender to receiver.

\* Main Memory

Memory that is used to  
(Comp) soft program  
addition are in tandem with it with  
the help of various types of  
processing

\* Memory Cycle Time

In the, it has played a  
more important role in memory.



## \* Memory Pools

The sub dividing of memory into independent sections

## \* Message

A block of info that may be exchanged between process as a means of communication.

## \* Mode Switch

A hardware operation that occurs that causes the processor to switch on a different mode (User/priv)

## \* Monolithic kernel

A large kernel containing virtually the complete operating system code.



## \* Monitor

A program has control over encapsulation validation, access controls and initialization done with an abstract data type.

## + Multilevel Security

The capability that enforces access control according to multiple levels of classification of data.

## \* Multiplexing

Mode of operation that provides for parallel processing by two or more processors of a multiprocessor system.

## + Multiprocesor

A computer having two or more



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process that have common access to  
main storage

#### \* Multiprogramming level

A no. of processes that are partially  
fully present in main memory

#### \* Multi-tasking

A mode of operation that provides for  
the concurrent execution of multiple  
programs on the same processor. The  
processes share common memory  
and often terminated by

#### \* TTUO

A key difference between the two  
is that the process that does  
the work.

In contrast, it is possible for  
one process to lock a tiny sum  
of memory in a block.



## Non-Privileged State

An execution context that doesn't allow some non-haltdwell instructions to be executed such as the halt instruction and i/o instructions.

### \* NUMA

A non-uniform multiprocessor in which access time of one processor to a memory location may vary with location of the memory area.

### \* Object Request Broker

An entity in an object-oriented system that mediates interactions between objects.



## \* Page

In virtual storage, a fixed length block that has virtual address that is transferred as unit between main memory and secondary memory.

## \* Page Fault

Occurs when page containing a reference is not in main memory.

## \* Page Frame

Occurs when page containing reference is not in main memory. This causes an interrupt and logic that proper page be brought into main memory.

## \* Page Frame

The fixed size contiguous block of main memory used to hold a page.



\* Paging

The ~~transfer~~ of page ~~lets~~ into memory & ~~several~~ ~~day~~ memory

\* Physical address

The absolute location of unit of data in memory.

e.g. word, byte

\* Preemption

Reclaiming a page from process before process has finished using it.

\* Prefetching

The retrieval of pages more than demanded by page fault.

The user's program adds at page will be needed in near future, considering disk I/O.



### \* Priority Inversion

A circumstance in which OS forces a higher priority task to wait for lower priority task.

### \* Privileged Instruction

An instruction that can be executed only in specific mode, usually by a supervisory program.

### \* Process

A program in execution. A process is controlled and scheduled by OS same as tasks.

### \* Process Descriptor

Same as process Control Block.

\* Recursion

The creation of new process by another process.

\* Procedure

The functional unit that interprets and executes instructions. A procedure consists of at least one instruction control unit and an arithmetic unit.

\* Program Counter

Instruction address register

\* PSW

Program status word covers conditions, exceptions made and status info but explicit study of a processor.

\* Programmed I/O



Form of 1/2 in which CPU issues  
IO command to module and  
wait for wait for operation to  
complete before proceeding

#### \* Real address

Physical address in main memory

#### \* Record

Group of elements treated as a unit

#### \* Relative Address

An address calculated as displacement  
from base add.

#### \* Rendezvous

In message passing, a condition  
in which both sender and  
receiver of message are blocked  
until message is delivered.



#### \* Round robin

The pollution of process that is actually in of main memory at your time.

#### \* Response Time

In data system, elapsed time between end of transmission of enquiry message and beginning of receipt of response message measured at enquiry terminal.

#### \* Round Robin

A scheduler alg. in which processes are activated in fixed cyclic order and all process run under equal rule. A process will cannot push each other. It is used for time sharing.

#### \* Scheduling

To select jobs process run



\* to be dispatched, In some cases, due  
unit of word such as 1/2 operating  
ability of shoulder

#### \* Segment

In visual news, it has visual address. The blocks of page may be of unequal length and may be of different  
values: → length.

#### \* Segmentation

The division of page or application  
into segments part of visual news show

#### \* Semaphore

An interval for signaling among planes  
Only one operation may be  
performed on a structure, at  
which all aircraft.

initially, descent (invis. Report) →  
exact definition of course, over  
may include area of a few miles  
Incent operation of may consist:  
the unblocking of points also



known as coating serve as a ground surface

### \* Sequential Access

The capability to enter data into storage device or data medium in some sequence as data also could be to obtain needed data in order as they were entered

### \* Sequential File

The file in which records are stored sequentially to value of one or more key fields are placed in one sequence from beginning of file.

### \* Shell

The portion of os that interprets instructions of user commands and job control language. It



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function or interface between user and OS.

### \* Spoof lock

Mutual Exclusion mechanism in which a process blocks in an infinite loop waiting for the release of lock which indicates availability.

### \* Spooling

The use of secondary memory as buffer storage to reduce processing delays when transferring data between peripheral equipment and the processor of a computer.

### \* Starvation

A condition in which a process is indefinitely delayed because other processes are given preference always.



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### \* Strong Semaphores

A semaphore in which all processes having the same semaphore are queued and will eventually proceed in the same order as they entered the wait (P) operations (FIFO Order)

### \* Swapping

A process that interchanges the contents of an area of main storey of size  $\frac{1}{n}$  of the contents of a memory area in secondary memory.

### \* Symmetric MultiproCESSing (SMP)

→ A form of multiproCESSing that allows the OS to execute on any available processor or on several available processors simultaneously.

### \* Synchronous Operation



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An operation that occurs regularly  
or predictably with respect to the  
occurrence of a specific event in  
other events.

\* Synchronization

situation in which two or more  
process coordinate their activities  
based on a condition.

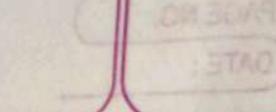
\* System Bus

A bus is a single, shared major  
communication component  
(CPU, memory, I/O).

\* System rate  
same as kernel mode

\* Task

Same as process

\*  

## Thrashing

A phenomena in virtual memory  
which processor swaps  
most of the swapping pieces but  
not executing instructions

\* 

## The Sharding

The concurrent use of device by  
no. of user

\* 

## The Slices

The maximum amount of time that a  
process can execute after being granted

\* 

## The Slices

A mode of operation in which lots  
of processes are assigned  
parts of memory as some processes.



\* Trojan Horse

Select unauthorised source editor  
with a useful program.

Execution of program is results of user  
select of malicious.

\* Trusted System

\* computer and OS not can do  
verified to implement a given  
security policy

\* Virtual address

The address of storage location in  
virtual memory.

\* Virtual memory

The space that may be regarded  
as addressed main storage by own  
of computer or which virtual address  
are mapped into its real address.

\* Virus

secret undivided routine embedded  
within a useful program

Execution of program results in  
executing of the Secret routine

\* Weak Sonaphore

A snap hole in which all grows  
watering on the surface grows  
in an unspecified order

\* Woolly set

The woolly set with pouch of  
flowers at Vizirka tree +

The flowers have to refine 3rd no  
part A fine white



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## worm

Program that can travel from computer to computer across network connections. It may contain a virus or bacteria

~~Assignment~~

Banerjee Algorithm



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Process	Allocation			Max	Work	Need
	A	B	C	Max	Work	Avail
P <sub>0</sub>	2	0	1	7	3	2
P <sub>1</sub>	2	0	0	3	2	2
P <sub>2</sub>	3	0	2	9	0	2
P <sub>3</sub>	2	1	1	2	2	2
P <sub>4</sub>	0	0	2	4	3	3

→

Process	Allocation			Max	Available	Max - Available
	A	B	C	Max	Available	Max - Available
P <sub>0</sub>	0	1	0	7	3	2
P <sub>1</sub>	2	0	0	3	2	1
P <sub>2</sub>	3	0	2	9	0	6
P <sub>3</sub>	2	1	1	2	2	0
P <sub>4</sub>	0	0	2	4	3	1

Need  $\leq$  work  $\Rightarrow$   
 $work = work + allocation$ .

Safe sequence  $\rightarrow$   
 $P_1, P_3, P_4, P_0, P_2$

Prounts	Allocation	Max Need	Pg-7	Available Pg(7)	Remaining Need
P <sub>0</sub>	0 1 0	7 5 3	(3) 3 2	7 4 3	
P <sub>1</sub>	2 0 0	3 2 2	$\frac{5 3 2}{(P_1)-2}$	1 2 2	P <sub>1</sub>
P <sub>2</sub>	3 0 2	9 0 2	7 4 3	6 0 0	P <sub>3</sub>
P <sub>3</sub>	2 1 1	2 2 2	$\frac{7 4 5}{(P_3)-2}$	0 1 1	P <sub>4</sub>
P <sub>4</sub>	0 0 2	4 3 3	$\frac{2 5 5}{(P_4)-2}$	4 3 1	P <sub>0</sub>
	7 2 5		$\frac{3 0 2}{(P_2)-2}$	1 0 5 7	P <sub>2</sub>

$$10 - 2 = 3$$

$$5 - 2 = 3$$

$$7 - 5 = 2$$

Thus,  $\langle P_1, P_3, P_4, P_0, P_2 \rangle$

Satisfies safety requirement  
and thus executed safely.



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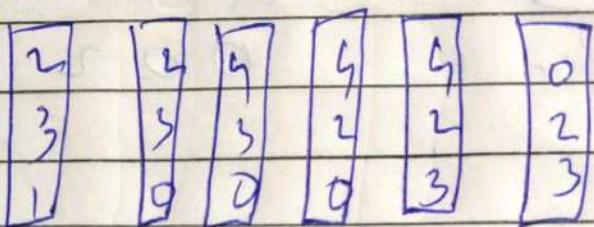
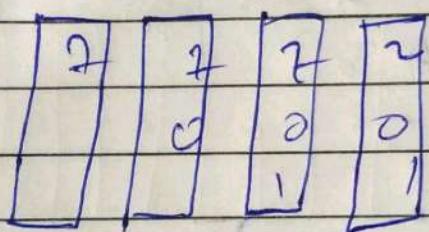
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## \* FIFO

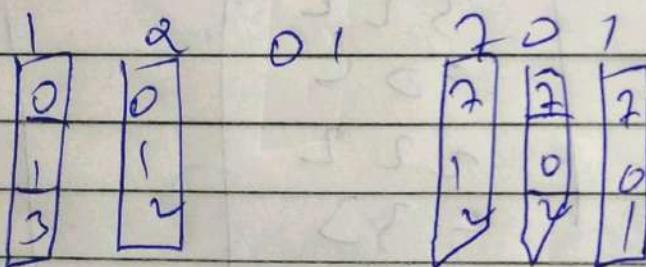
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30 31



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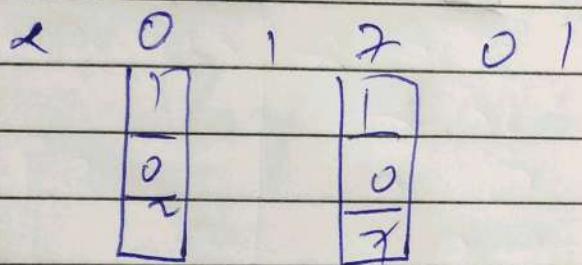
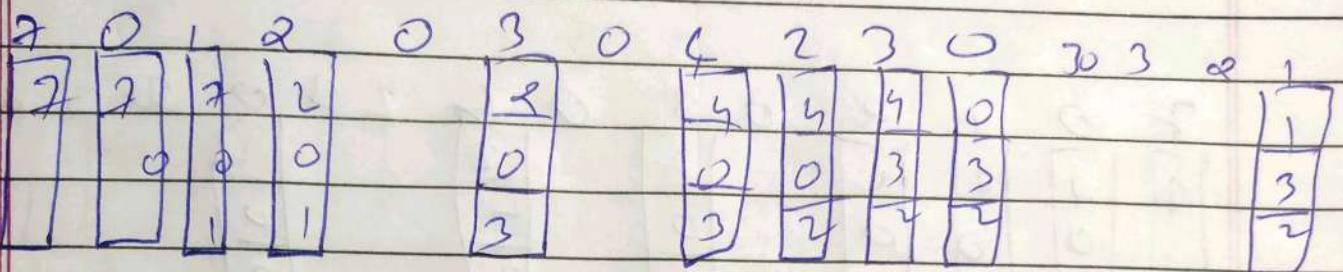


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\* LRU

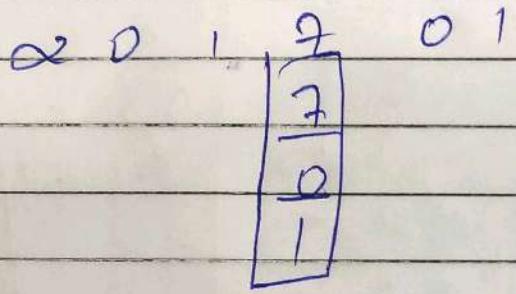
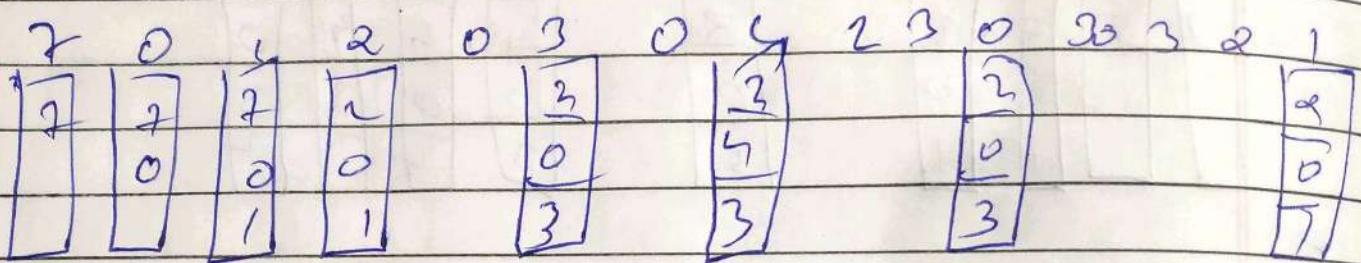
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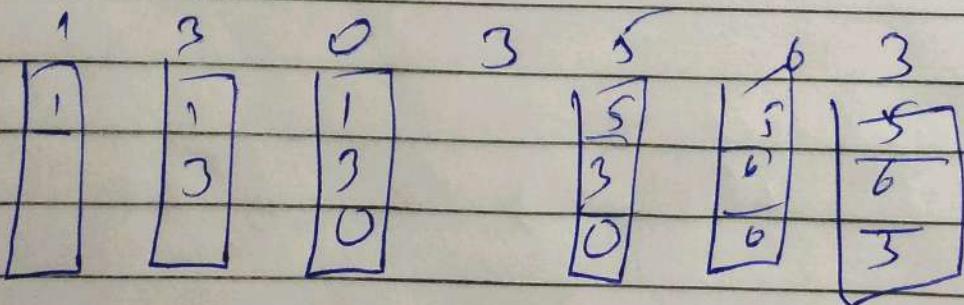
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page fault = 9

FIFO

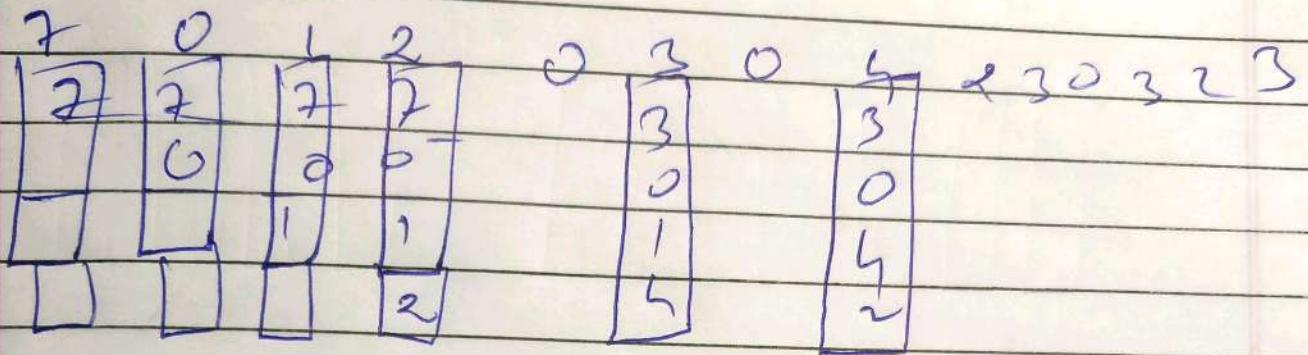
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Page fault = 6      no. of faults = 3

2) Optimal

7, 9, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 3



Page Fault = 6

No. of Trans = 4.