



MAH
BOARD OF
(M)

To be filled by the Candidate

Subject :- OSY

Subject Code :- 22516

Section :- -

Course and Year/Sem :- CO-5I

Date :- 05/01/2023

Main Ans. Book	No. of Supplements	Total
<u>1</u>	<u>0</u>	<u>1</u>

Please read instructions to examiner and examinees overleaf

PCDC	<u>2</u>
RAC	<u>0011</u>
INST	<u>1095</u>
CC	<u>-</u>
NC	<u>10</u>
TOTAL	<u>10</u>

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<u>9</u>	<u>3</u>	<u>7</u>	<u>4</u>
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Signature of block
Supervisor / Invigilator

Chamika
5-1-23

Q. No.	a	b	c	d	e	f	g	h	i	j	k	l	m	n	Total	Q.C.
1	02	02	02	02	02	02	02								10	10
2		03	04	04											11	11
3	04	04	03												11	11
4	04	02	04	04											12	12
5	05	01	05												10	10
6	06		06												12	12
7															-	-
8															-	-
Sign and Name of Examiner															Total	66 66

Q.No.	UV/OV/PH Marks		Marks Validation by RBTE 3 member Committee	
	Verifier Marks	Marks Validation by 3 member Committee	Marks on Answer Book before Verification	Marks on Answer Book after Verification
1	10			
2	11			
3	11			
4	12			
5	10			
6	12			
7	1			
8	1			
Total	66			
Sign	<u>[Signature]</u>			

Q.1 — — — ?

a) — — — ?

⇒

Multi Programmed O.S.

Multi tasking O.S.

1] No interaction between user and operating System

It is a interactive operating System.

2] There is a no fixed response time.

There is a fixed response time.

3] It is Simpler than multi tasking

It is complex than multiprogramming.

4] Process execution in CPU one by one and all process are resides in a main memory

All Process resides in a main memory but it Swapped this Process before its Executing.

b) — — — ?

⇒ Services provided by O.S.

① Program execution

② File management

③ Error Detection

④ I/O device management

⑤ Communication

c) --- ?

⇒ Process :-

- Process is a Program under execution is called as Process.
- Process contains a context switch.
- Process is a heavy weight Process.

PCB :-

- PCB is known as Process Control Block.

- Process control block is a data structure or a Record that Store the all the information about the Process
- each Process has one its own PCB.

- When Process is create then PCB is

Create and when Process is terminate at that time PCB is terminated.

e

d) --- ?

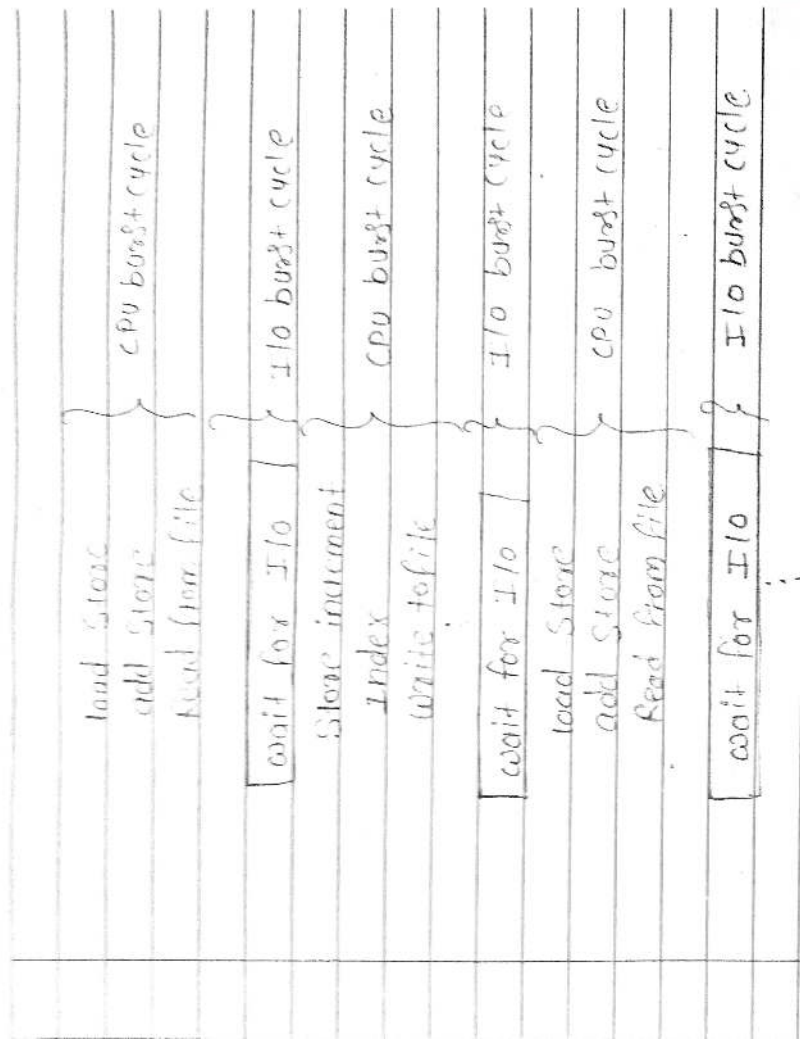
⇒ - CPU burst cycle :-

It is a Time Period when Process is busy with the CPU.

o2

- I/O burst cycle :- It is a time period when Process is busy and working with the I/O operations

The Process containing the CPU execution, And I/O wait.



e)	Paging	Segmentation
1] In multiprogramming, the Degree of multi-programming is less	The Degree of multi-programming is more	higher
2] It is closer to operating system	It is closer to user	
3] O.S. is responsible	Compiler is responsible	
4] It is faster than Segmentation	It is slower than Segmentation	

c) The Page Table is used to maintain the Page information

d) The Segment Table is used to maintain the Segment information

Q.2)

b)

⇒ Co

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1)

2)

3)

4)

5)

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D) ?

⇒ 1) Kill : It is used to kill a process via its process id.

Syntax : kill pid

Q.7)

1) Sleep : It is used to pause the process execution for a specified time.

Syntax : 1) Sleep option

2) Sleep Number [suffix]

g) ?

⇒ File operations

Q.8)

① create :- It creates a new file with no data

② close :- It close a file when its task is complete

③ read :- Read from file

④ write :- write to the file

⑤ Append :- add information to the end of file

⑥ open :- To open a file

Q.2) — — — ?

b) — — — ?

⇒ Components of O.S.

There are 5 Components of O.S

- 1] Process Control
- 2] Main memory management
- 3] I/O device management
- 4] File management
- 5] Secondary memory management.

1] Process Control :-

In Process Control Component, The Program under execution is called as Process.

- In Program execution There are many resources are required like CPU, memory, file etc.
- In process control The process is created and process is terminate.
- The process is create, delete.
- The management for the Synchronization.
- The management for the Communication.
- The management for Deadlock and Inter process Communication.
- The process is read, write and reposition.

2) File management :-

The File is a collection of inter related or related data.

- when file is created then it is a empty file created.

- There are many operation perform on file.

- File is store very large data.



- when the process is in a execution at that time the CPU store data in temporarily in a RAM (Random access memory).

This data is vanish at the time of complete of the process.

So the file is create and store data in a file.

- File data is does not delete until the user delete a data.

c) — — — ?

⇒ The Synchronization and Communication are two model in a Communication of two Processes.

The ~~indirect~~ process is does not performed the communication between 2 process.

- The Co-operation process is allow to perform communication between the 2 process.

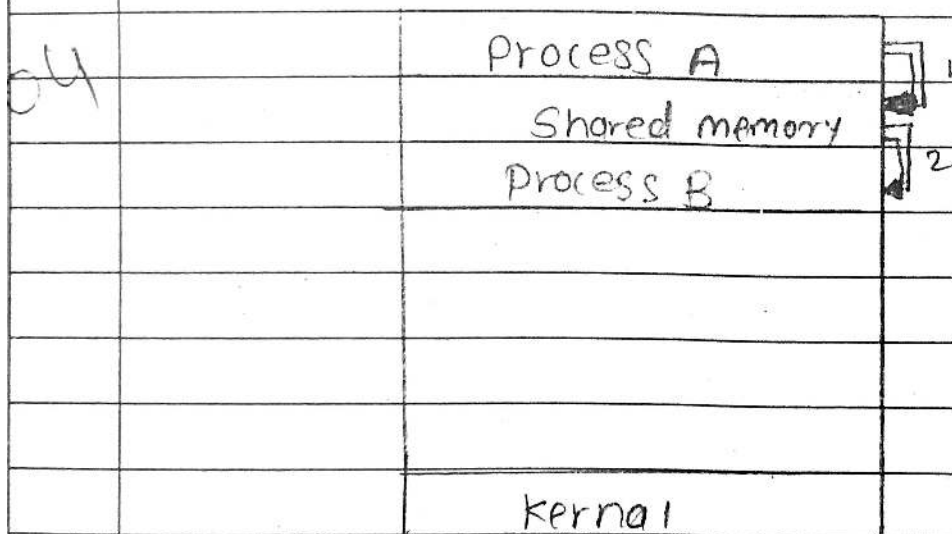
The IPC is known as InterProcess Communication who all work on the Co-operating Process.

There are Two Types of communication between 2 Process in the IPC

- ① Shared memory
- ② message Passing.

In this Shared memory we can use a common data to share.

The Shared memory diagram as follows:-



In this system those process are communication each other this process is and sharing their task.

- There is kernel not in a use.
- The two process creates a shared memory between process and share their information.

d)

?

=> Scheduling criteria.

2.2)

a)

There are many Scheduling criteria present in Scheduling.

① Utilization :-

The amount of time process when CPU is busy.

② Throughput :- The No. of Jobs Processed Per time unit.

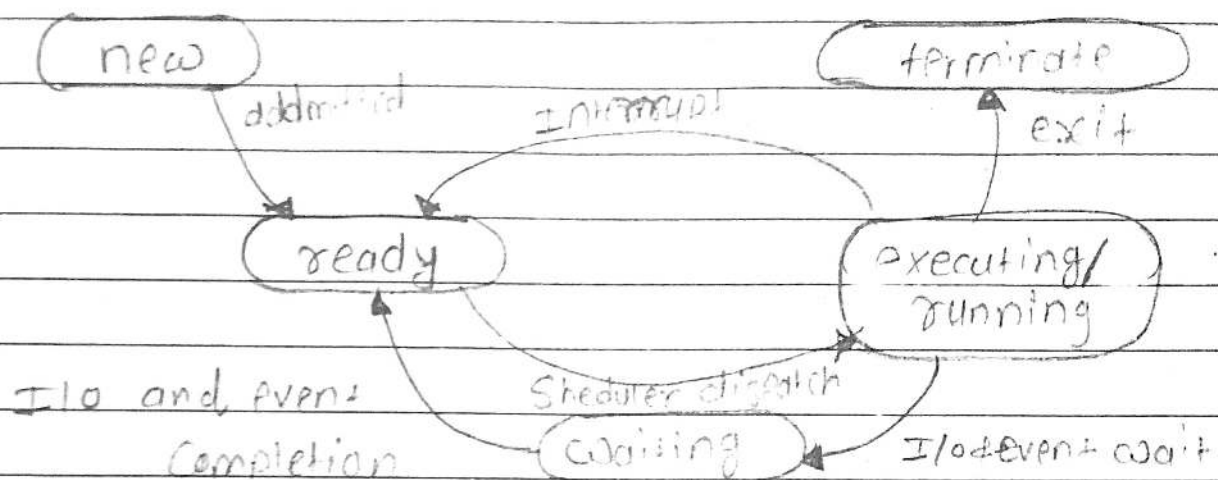
③ Turnaround Time :- The time of submission of process and the time of completion of process is called as TAT i.e. Turnaround Time.

④ waiting time :- The process is in ready queue and wait for CPU, the time some time spent in ready queue is called as waiting time.

⑤ Fairness :- Every process should be fair share a CPU time.

⑥ response time :- The time of process completion at first time is called response time.

Q.3) --- ?
a) --- ?



The Process is a Program under execution. When process is execution then its change its state. like new, ready, waiting, running, terminate.

There are five state of process

① New :- In this state the new process is create.

② Ready :- In this state the process is New to ready queue transfer.

This Transition is complete the long term Scheduler.

- The process is wait for CPU in the ready state.

③ waiting :- when process is in execution at the time of it required a some I/O devices and event so it request

the input/output devices the these process is goes in a waiting state.

after the I/O operation this process is go in the ready queue and perform execution.

1) Running :- In this state the ready queue process is the running state as per schedule and it allocate the CPU and its perform the running operation.

terminate :- In this state the process is terminate, exit from the system.

b) — — — ?
⇒ In multiprogramming there are many process to complete their task. the finite processes the perform the no. of task.

The process is request to the resource at the time of resource are not available then the process is goes in a waiting state. Sometime the waiting state is not response the and not change their state because of those resource are held by another resource at the time of

deadlock is occur.

There are 4 Conditions of deadlock Prevention

- ① Mutual exclusion
- ② Hold and wait
- ③ No Preemption
- ④ circular wait.

① Mutual exclusion :-

It is the first Deadlock

Prevention.

- In these Condition Non-Sharable resource are present.
- For example the Printer. The Printer does not share a resource.
- In the printer lack of paper is present and printing is execution at the time of printer does not share the resource.

② Hold and wait :- In this Condition at least one resource are hold and request to another Resource which is can be hold another Process.

- at the time of 2 protocols are used.

1] First one is the all the resource are released and complete there other Process execution and when the process execution is complete then request the resource

2) Second Protocol is used to all resources are collect and process execution is complete.

③ No-pre-emptive :- The Required Resource are not - Pre-empted.

- The Required Resource are not Pre-empted means a when process can be request these process can be held by another process.

④ Circular wait :- In this State the Set of process is present and circular wait Condition is Occure.

- In this System when P_1 is Requested to the process held by resources i.e. the P_2 Process Resource.

- There are 3 process and 3 Resource are P_1, P_2, P_3 and R_1, R_2, R_3 Present Simultaneously.

P_1 is hold Resource R_1 and Request to the R_2 then P_2 is hold R_2 and Request to the R_3 and the last P_3 process hold R_3 and Request to the P_1 Resource R_1 . is called as Process in a circular wait.

c) -----?

⇒ Fixed Sized memory Partitioning.

In the operating system there are many process is created. and it store into the main memory.

The main memory divide into the multiple Partitioning is called as a Partitioning.

There are Two Types of Partitioning

- ① Fixed Size Partitioning i.e. Static
- ② Variable Size Partitioning i.e. Dynamic

① Fixed Size Partitioning :-

In Fixed Size Partitioning, The main memory is divide into the Fixed Partion or equal Partition is Called as Fixed Partitioning

There are two Types of Fixed Partitioning

- ① equal and ② unequal.

① equal :- In equal partitioning the main memory is divide into the equal fixed Partition is called equal Partitioning

② unequal :- In this Partition the main memory is divide in to the

Unequal Fixed partition is called as unequal fixed partition.

0.5	8 mb	OS 5 mb
8 mb		12 mb
8 mb		10 mb
8 mb		9 mb

equal partition

unequal partition

Q.4 --- 2
a) --- 2

Command line interface	Graphical user interface
1] CLI Stands for Command line interface	1] GUI Stands for graphical user interface.
2] The CLI interact with the System use text and commands	2] The GUI interact with the System or user used button, Scrollbars, textfield, radio button, checkbox, text area etc.
3] It is not a user friendly language or a interface	3] It is a user friendly interface

4) It remembers the commands

It does not remember the commands

5) It is faster than GUI

6) It is a slower than CLI

7) It requires a more memory allocation

8) It requires a more memory allocation

--- ?

System calls of file management

There are many system calls present in a file management.

1) create, Delete, Open, Append, read, write, etc

2) create :- In this system we can create a new file with no data.
- and its file is find to space of memory.

3) Delete :- In this system call we can delete a file which is in a not use in the system.

free space of management.

we can delete a file for give a free space in a disk.

③ open :- In this System call we can open a file before it is using.

④ close :- we can close a file when the all the execution of a file is complete. at that time we can close a file.

⑤ read :- In this System call we can also read the file.

c) — — — ?



long term Scheduler

Short term Schedules

1] In this long term Scheduler we can load a process new State in the main-memory i.e. a ready Queue.

1] In Short term Scheduler we can Transfer a process main memory in to the running / executing Queue.

2] The Speed of long term Scheduler is less than Short term Scheduler.

2] The Speed of Short term Scheduler is more than long term Scheduler.

3] The Tran
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State

4] The lo
Schedul
Called
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5] In lon
Schedul
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3] The Transition of
New to ready
State.

3] The Transition State
is ready to running
State.

4] The long term
Scheduler is also
called as Job
Scheduler.

4] The Short term Scheduler
is also known as
CPU Scheduler.

5] In long term
Scheduler the Process
Consist CPU bound
and I/O bound

5] In this Scheduler the
new Process is directly
assign to the CPU

Q.5) — — — ?

a) — — — ?

i] Device Management

① In the operating system there are multiple process are execution at the time of execution they need a some I/O device at the time of it does not possible to give directly I/O devices.

— Then the I/O device are provided to the process by using Device management

② Device management provides the different resources to the process like CPU (central processing unit), file, printer, hard-disk, memory etc.

— In device management the "ls" command is used.

ii] Performance monitor :-

① In this performance monitor tool the process is monitoring.

② In this tools we can use vmstat, iostat, netstat, top, all the commands are used.

iii) Task Scheduler

In this task scheduler we can schedule the process task.

- we can use different scheduler to perform Task Scheduler like long term scheduler, short term scheduler and the medium term scheduler.

① Long term Scheduler :- In this term,

when a process is submitted to the system for the purpose of processing.

This all the time long term scheduler is present and he know it. then the

- Scheduler is place into the process in to the main memory.

- The CPU Bounds is requires a more time of CPU and takes a less time of I/O Bound and vice versa the I/O bounds takes a less time to CPU and take a more time of I/O devices.

② Short term scheduler :- In this scheduler, the process is in ready queue wait for the CPU. then the short term scheduler is place into the running state.

- In the running state there are some policy like FCFS (first come first serve, Round Robin, Shortest Job First, priority scheduling).

This policy is run the execute the process and complete them.

③ medium term Scheduler :- In this Scheduler the process can be swapped them

- If the multiprogramming Degree is increasing at the time of medium term Scheduler is Swapping Perform.

- It is useful for send a max of job. etc

b) - - - - ?

i) wait 2385018

- The process is wait for 2385018 time of millisecond or

- The process 2385018 is job id or process

ii) Sleep 09

- It returns the status of the process

Refer

7

Refer

1

2

3

page

2

2

0

1

X

X

1

2

3

page

1

2

3

page

1

2

3

page

2) First Page replacement algorithm

Reference String

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

Reference String	7	0	1	2	0	3	0	4	2	3	0	3	2	
Page Fault	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Page Hit														
Page Fault	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

Page Fault = 9

Page Hit / Miss = 11

Page Hit / Miss = 11

Page Hit / Miss = 11

Page Hit / Miss = 11

iii) LRU (Least Recently used algorithm)

Reference String	7	0	1	2	0	3	0	4	2	3	0	3	2	
Page Fault	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Page Hit														
Page Fault	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

1	2	0	1	7	0	1
1	1	1	1	1	1	1
3	3	0	0	0	0	0
2	2	2	2	7	7	7
✓	X	✓	X	✓	X	X

69

Page fault = 12

page hit / miss = 8

Q.6) --- 2

ii) Pre-emptive STF

Gantt Chart

P_{11}	P_{12}	P_{14}	P_{11}	P_{13}
0	1	5	10	17
				28

Process	Turnaround Time	Waiting Time
P ₁₁	$(17 - 0) = 17$	$(17 - 8) = 9$
P ₁₂	$(5 - 1) = 4$	$(4 - 4) = 0$
P ₁₃	$(26 - 2) = 24$	$(24 - 9) = 15$
P ₁₄	$(10 - 3) = 7$	$(7 - 5) = 2$

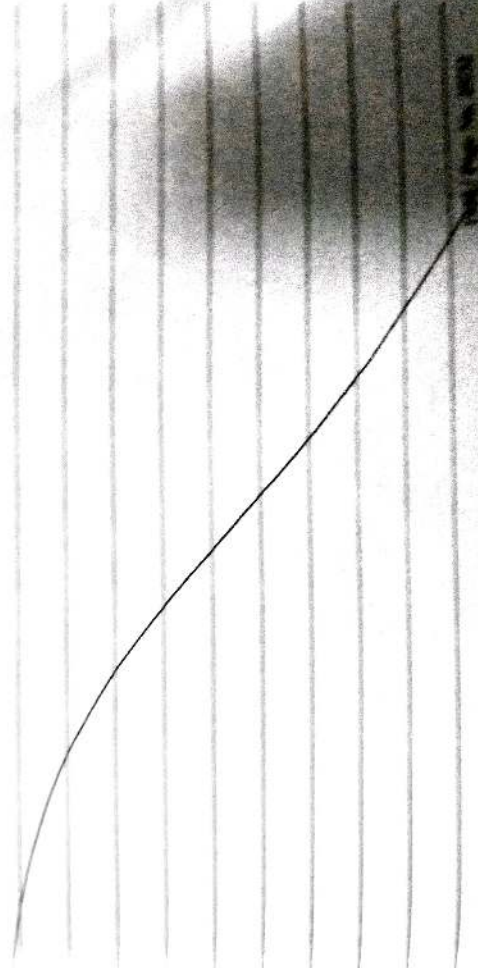
average waiting time = $(9 + 0 + 15 + 2) = 26$
 $26 / 4 = 6.5$

[illegible]

1811111234

3

250



c) $\Rightarrow$ directory Structure of File System

There are Three directory Structure of File System

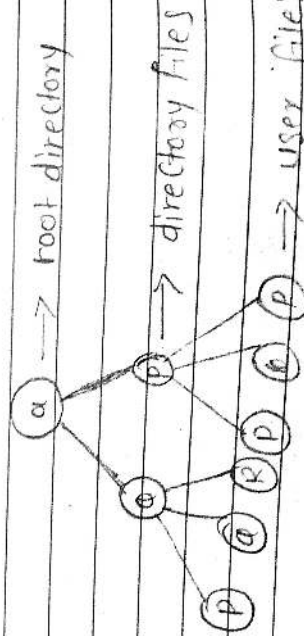
- ① Single-level directory Structure
- ② two-level directory Structure
- ③ tree Structure.

② two-level directory Structure.

- In two level directory Structure is provided

- two level directory Structure is used to overcome the Single level directory Structure.

The two level directory Structure diagram followed.



In this two level directory Structure, a root directory, directory files as user files.

The root directory is top of this directory.

here, we
of this
and this
user
This is.

② tree St

a file is
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- tree Stru
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- The tree
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here, we can define only two directories of this example 1 diagram.

- and this Directory Files contains the user file.

This is the two level directory Structure.

② tree Structure :-

This directory Structure of a file is also called as Hierarchical level directory Files.

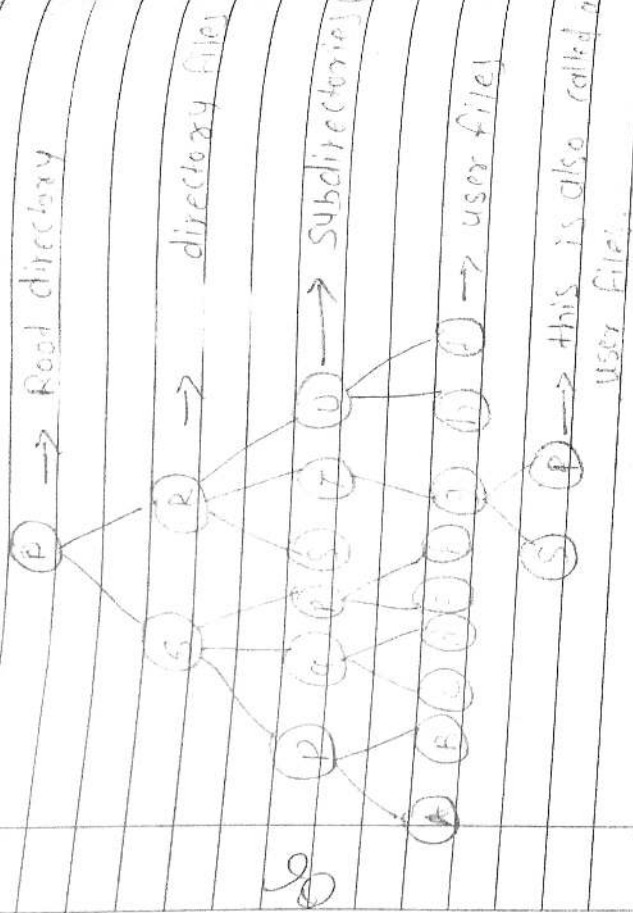
- tree Structure is also called as the Hierarchical Structure.

- The tree Structure contains the files and group of files. This is called as internal Structure, and tree Structure provides a read operation of file then it return a one record. at the same. So when the we can write operation is perform at that time one record is return to the tree Structure.

tree Structure contains the record. Sometime it does not necessary to return a record.

- The record consist of key field in the structure.

The tree structure diagram is given below



Q.4)

d)

SJP

Gantt chart



Process	TAT	WT
P1	26	17
P2	10	3
P3	3	0
P4	17	10

$$17 + 3 + 10 =$$

Avg waiting time =

FSES

Grantt Chart



process	Waiting time
p1	0
p2	9
p3	16
p4	19

$$\text{Avg waiting time} = (9 + 16 + 19) / 4$$

$$= 11$$

$$[\text{Avg waiting time} = 11]$$

0.4

