I Mid term

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18ERECS065

OPERATING SYSTEM

SET - B

(1)

(a) BIOS ⇒

BIOS (Basic Input/output System) is the program a computer's microprocessor uses to start the computer system after it is powered on. It also manages data flow between the computer's operating system (OS) and attached devices such as the hard disk, video adapter, keyboard, mouse and printer.

Functions of BIOS

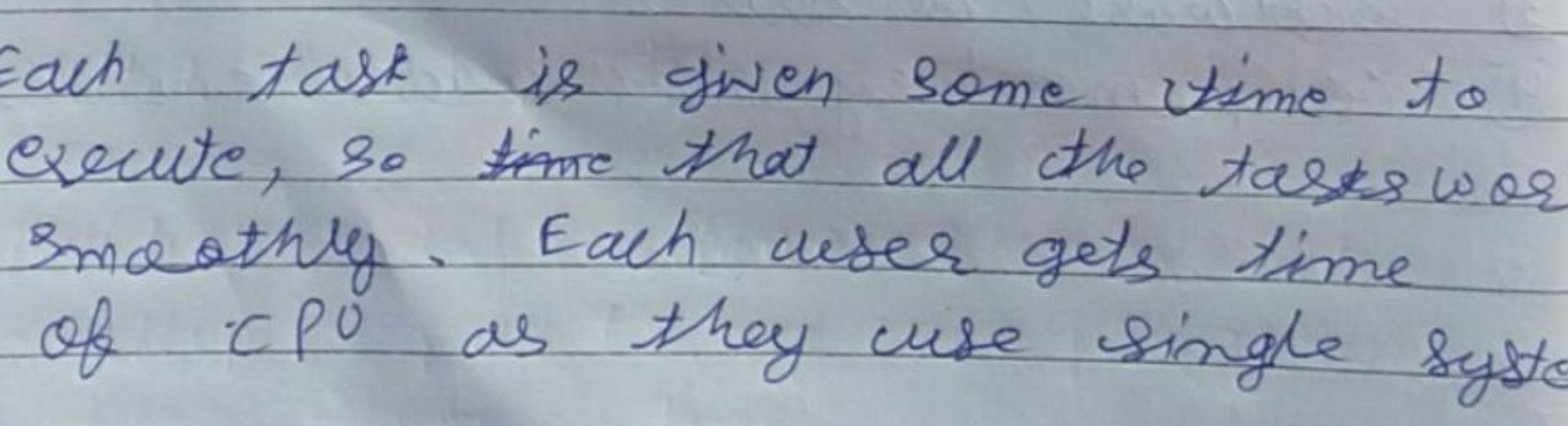
1) Power-on self-test
2) Bootstrap loader
3) Software / device driver
4) Complementary metal-oxide semiconductor

b) Types of Operating System

Some of the widely used operating systems are as follows.

① Batch Operating System⇒

This type of operating system does not interact with the computer directly There is an operator which takes similer jobs having same requir and group them into batch



② Time - Sharing Operating System⇒

Each task is given some time to execute, so ~~time~~ that all the tasks work smoothly. Each user gets time of CPU as they use single system

③ Distributed operating System:⇒

These types of operating system is a recent advancement in the world of computer technology and are being widely accepted all-over the world and, that too, with a great pace

④ Network Operating System⇒

These system run on a server and provide the capability to manage data, users, groups, security and other network function.

⑥ Thread⇒

A thread is a path of execution within a process.

⑤ Real-Time operating system⇒

These types of OS serves the real-time systems. The time interval required to process and respond its inputs is very small.

(b) Thread ⇒

A Thread is a path of execution within a process. A process can control multiple threads

Process	Thread
1) Process means any program is in execution	Thread means segment of a process
2) process takes more time to terminate	Thread task less time to terminate
3) It takes more time for creation	It takes less time for creation
4) It also it takes more time for context switching.	It takes less time for context switching.

Multithreaded model

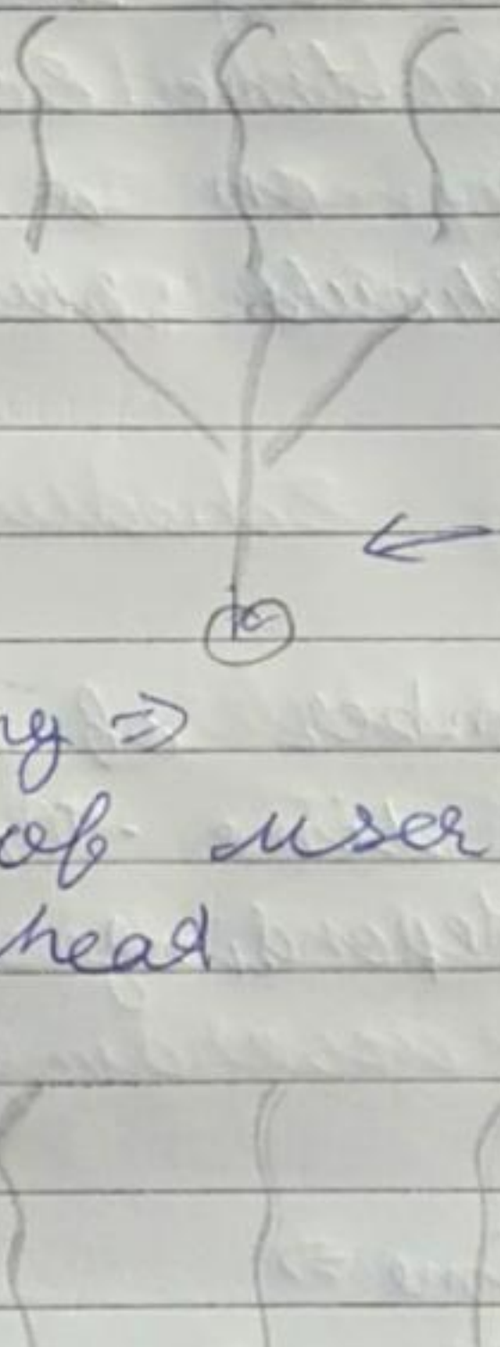
Multithreading allows the execution of multip parts of a program at the same time.

These parts are known as threads and are light weight process within the process.

The main model for multithreading is one to one model

Many to one ⇒

The many to one model maps of the user threads to a single kirnal thread



Many to many ⇒

many of user thread to many kernd thread

(2) (a) CPU Scheduling criteria ⇒

~~Different~~ CPU Scheduling

There are several different criteria to consider when trying to select the "best" Scheduling algorithm for a particular situation and environment including:-

- CPU utilization ⇒

  Ideally the cpu would be busy 100% of the time so as to waste 0 cpu cycles. on a real system CPU usage should range from 40% to 90%.

- Throughput ⇒ Number of processes completed per unit time - May range from 10/s to 1/h depending on the specific processes.

- Turnaround time ⇒

  Time required for a particular process to complete, from submission time to completion

- Waiting time :→ /

  How much time processes spend in the ready queue waiting

their turn to get the CPU

- Response time ⇒

The time taken in an interactive program from the issuance of a command to the commence of a response to that command

(b) Fair Share Scheduling ⇒

Fair Share Scheduling is algorithm for computer operating system in which the CPU usage is equally distributed among system users a group, as opposed to equal distribute among process.

Ex A B C D

The Scheduler will logical divide of usage to each and one by one they will other for 25% and then other and repeat the step.

④ (a) Long Term Scheduler ⇒

Long term scheduler is also known as a Job scheduler. This scheduler regulates the program and select process process from the queue and loads them into memory for execution.

(b) Medium Term Scheduler ⇒

Medium-term scheduler is an important part of swapping. It enables you to handle the swapped out-processes.

(c) Short Term Scheduler ⇒

Short term scheduler is also known as CPU scheduler. The main goal of this scheduler is to boost the system performance according to set criteria.

⑤ Preemptive Scheduling ⇒

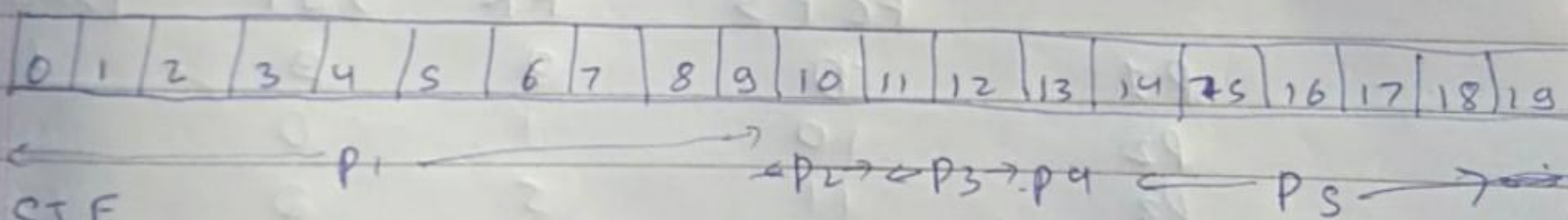
It is a CPU scheduling technique that works by dividing time slots of CPU to a given process. The time slot given might be able to complete the whole process or might not be

able to it.

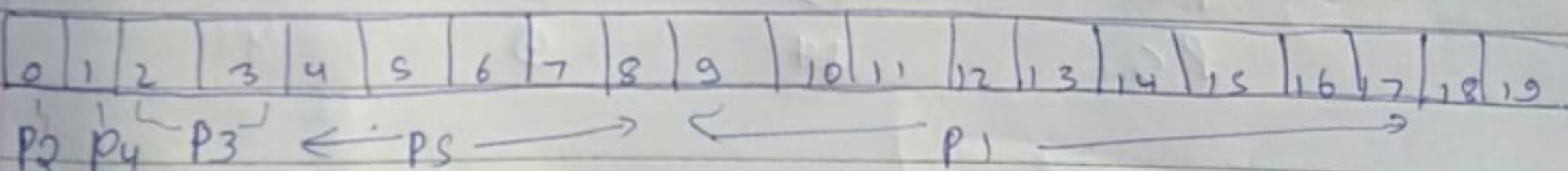
NON-preemptive ~~Sta~~ Scheduling ⇒ It is a CPU Scheduling technique the process takes the resource (CPU time) and holds it till the process gets terminated or is pushed to the waiting state. No process is interrupted until it is completed, and holds it till the processor switches to another process.

Ans 3 ⓐ Four Gantt charts are as follow

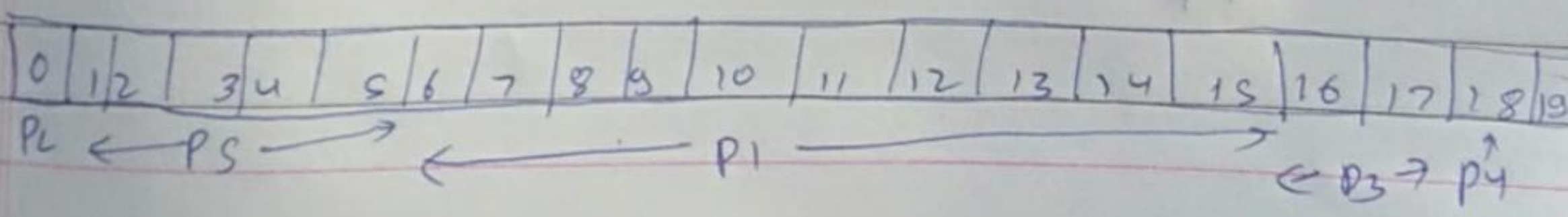
FCFS



SJF



Non-Preemptive Priority



RR quantum

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

(b) Turnaround time

	FCFS	RR	SJF	Priority
P1	10	19	19	16
P2	11	2	1	1
P3	13	7	4	18
P4	14	4	2	19
P5	19	14	9	6

(c) Waiting time

	FCFS	RR	SJF	Priority
P1	0	9	9	6
P2	10	1	0	0
P3	11	5	2	16
P4	13	3	1	18
P5	14	9	4	1

(d) Shortest Job First (3.2 ms).

RR

① FCFS

P1	10
P2	10+1 =11
P3	11+2 = 13
P4	13+1 =14
P5	14+5 = 19

Finish Time = (start-time + Burst-time)
Turnaround Time = Finish Time (Since AT = 0
waiting time = turnaround time - burst tim

② SJF

P2	1
P4	1+1 =2
P3	2+2 = 4
P5	4+5 = 9
P1	9+10 = 19

③ Nonpreemptive priority:

P2	1
P5	1+5=6
P1	6+10 =16
P3	16+2 =18
P4	18+1 =19

④ RR (q=1)

(5)

(a) The values of Need for process P_0 through P_4 respectively are (0, 0, 0, 0), (0, 7, 5, 0), (1, 0, 0, 2), (0, 0, 2, 0), and (0, 6, 4, 2)

$P_0 \rightarrow P_3 \rightarrow P_4 \rightarrow P_1 \rightarrow P_2$

(b) The system is in a safe state? yes. with Available being equal to (1, 5, 2, 0), either process P_0 or P_3 could run.

(c) yes group.