allocation

CPU

2 main objectives

TYPES OF O.S

① Batch O.S (1960s)
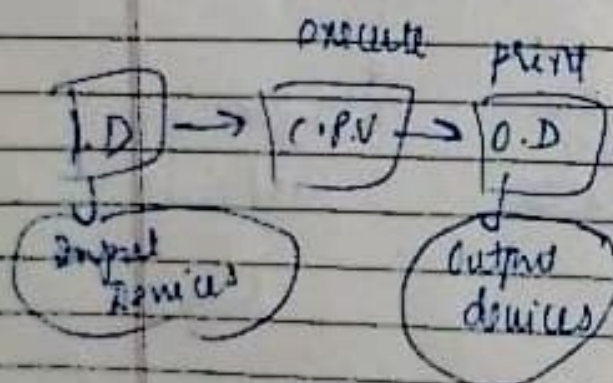
organisation
↓
computer system → operated by
Operator

Data by
a person
who can't
run
computer

↓
Run

▷ Batch wise
operation of Tasks

execute   print

[I.D] → [C.P.U] → [O.D]

input
devices

output
devices

⎤ at a time
⎦ one used
to work

1. When I.D is busy C.P.U and
O.D is not busy.
2. Then if C.P.U is busy then
I.D & O.D are idle.

(#1) O.S (operating system)

↓ → 1 diagram

Introduction   comp block
what is os   diagram
↓
4 definitions
Tursharound line

(#2)

Objectives of O.S — hardware
                              ↓
                           human
burden transfer   convnience
to computer
                         no debugging
↑m
↓
human comfort.

O.S   system   interface b/w
and other Software   hardware
                                &
↓   human
device
Drive
                human — both hardware
                              ↓
                         system software
                              os'

direction of magnetisation is read by magnetic reader → So direction given may be 1 or 0.

→ read by if CPU has processed and o/p is busy

magnetic materials going it in parts to readily output
under it process can also be
actually queued in DISC
↓
Dispatched directly from DISC

plastic ribbon with magnetic material (ferric oxide)

Tape ~~disc~~ is sequential memory

That is only we use DISC not tape

DISC - Random Access
↓
kahi par read karlo
kahi par write karlo

3. If O·D is busy, ID and
CPU idle

Output
↓
(then printing)

DRAWBACK

No interaction
with user and
process

Day 1: 1+2 for
        2+3 will head
to come on

DISE TECHNOLOGY

to ve
creat
Latches
a batch then within
Then we do one
job. Job 1 in then
it goes to CPU, so
simultaneously
we can
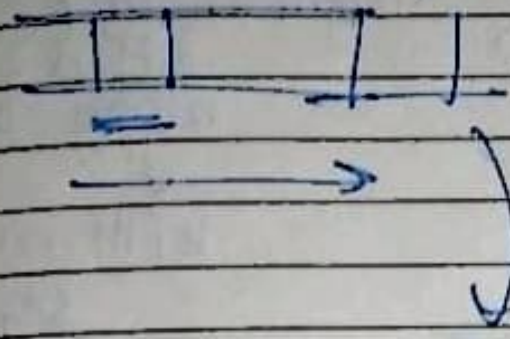insert Job 2
in ID then
Job 2 in CPU
Job 1 in OD
Job 3 in ID

Disc

Card
Reading

CPU

Line
Printer
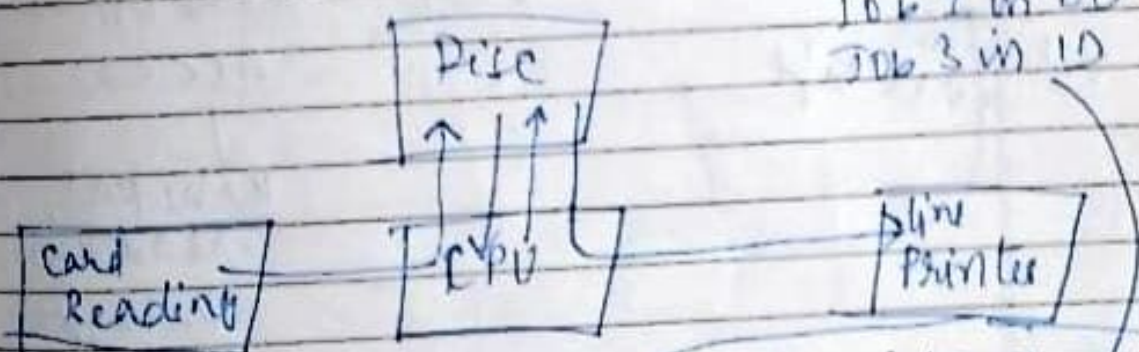
Then issue
arises on changing
from batch 1 and
batch 2. Then time
wasted

Spooling

many Jobs inserted and queue
formed in Disc
so to make busy CPU
buffer is formed at DISC.

→ Already passed

tape

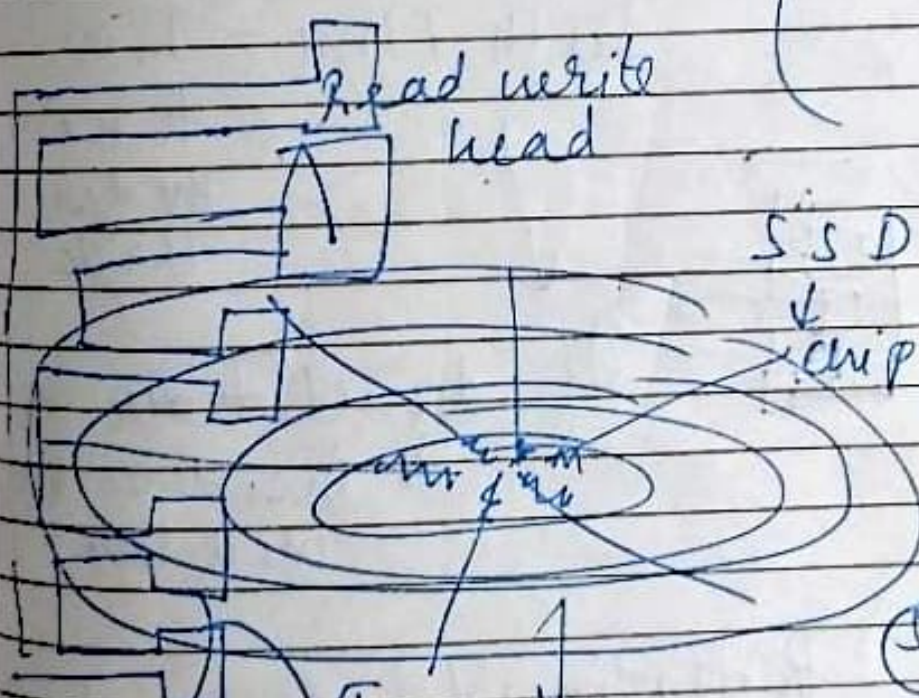To analyse it again we need to rewind tape.

B : Bytes
b : bits

For songs in old time

} Tape fast forward or rewind.

Read write head

S S D
↓
chip form

magnetic Disc

$5 \, 1_2 \, B$

Head assembly { by upper surface } { by lower surface }

1 sector : same storage → density inside

smallest memory accessed or written to a disc

→ Density out side

seek time + Rotational
latency
+
Transfer Time

$$= \text{ACCESS TIME}$$

Depends on transfer
Rate.

SSD Over HDD

as seek time
& Rotational
latency is
avoided

Advantage
in back up

Tape length — kitni bhi ho
sakti hai
— low cost

Disc ka stack banta
Desc को भी rahega.
changed in advanced

hard
dis {

Magnetic Disc and other

~~many CD plates~~

↓

with minor gaps

↓

to prevent scratch and requirement of read write head.

Seek Time — Time to search the desire track

↓

If desired track is inside so time will take more

Time waste {

Rotational Latency — Time required for the desired track to reach under head.
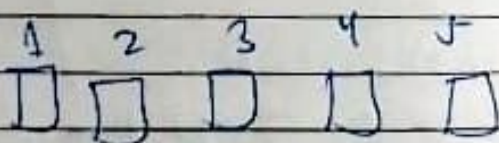
on desired track reach then sector rotation

E. books latest
addition.

↓

But take can
be changed
in advanced

↓

Tape has to be seen one-time
and completly
    like a movie

disc is for navigating
    multiple song
        at random

{ ② multi programed ————

③ multitasking / Time sharing

Diff.

→ 1 2 3 4 5

$$\square \square \square \square \square$$

1 quer q 1 then 1 quer for
2 then 1 ques for 3
— . . . 1 quer for 5.

By-the-time stud 1 prepared
to ask ques 2 comp cP v is
So fast that it has dealt with
each student. So student learn

→ free teacher's (CPU's) absence.

↓
works only till a certain limit. [unclear]
If no. of students become as infield

of 5, then CPU will take time to
return back to student 1.

↓
ii sib crash during exam
results.

Response Time

→ Time interval b/w Summation of job and 1st response

Ideally
Response time should be 0.

Jitni zyada response time due to zyada jobs

student 1

   2   3   4   5

D D D D D

[5 ques each] ⟶

People 1 ke saare ques solve kiya

fir 2 ke saare kiya

fir 3 rd ke saare kiye

|
⋮
(nth) ne saare kiye.

to the person at last has to wait a lot.

↓
Response time increases

ques g no realise cpu's absence. Also hest of students doit

~~system~~ ~~output~~ behaviour
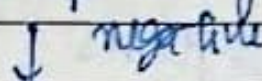
↓

fil operating ~~system~~
↓ negative

cant interact with os.

input
Can't change ~~output~~
based on ~~output~~.
output.

| 1D | | CPU | | OD | The |

like buffer.
↓
Disc advantage

↓
Random
Access

↓
disc as a
buffer

↓
Queue in ~~~~.
disc..

so even y
1D and CPU
are fast

but output will not
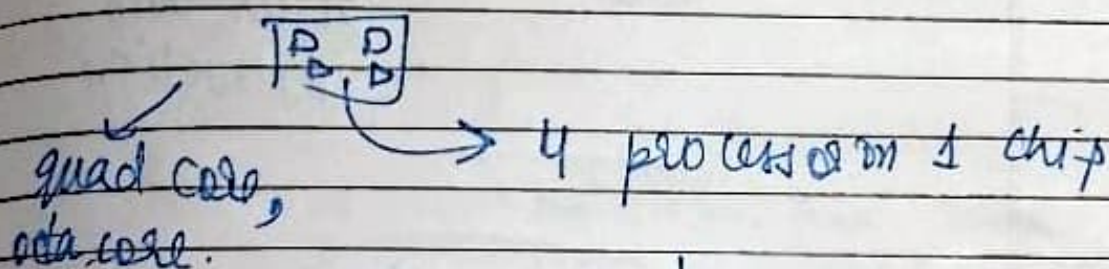be produced til the
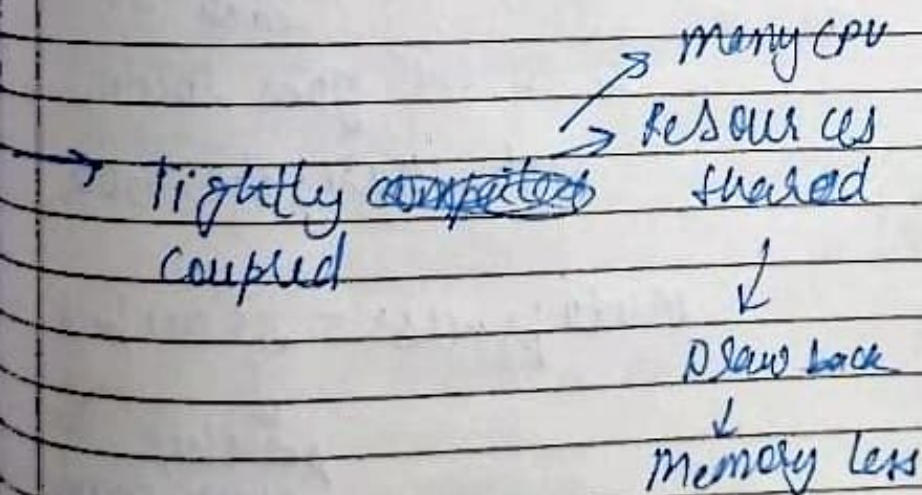flow OD
↓
Similariste y CPU
of flow then
OD will sit idle.

◻️ ◻️ ◻️ ◻️

chips
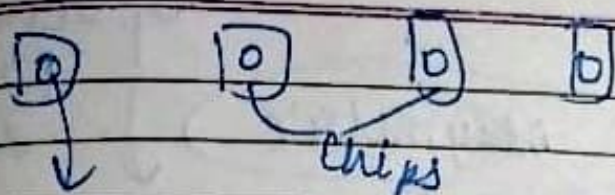
A processor on 1 chip

↓

MULTI PROCESSOR

[P P P]

→ 4 processor on 1 chip

✓ quad core,
octa core.

↳ MULTI CORE.

Disadvantage - costly to buy ~~Process~~

→ many cpu
→ resources
→ Tightly ~~computer~~ shared
coupled
↓
Draw back
↓
memory less

PAN

↓

personal area network

within

one room

Intanet

→ network of networks

↓

Biggest network

Intranet

↓

Organisation

specific

↓
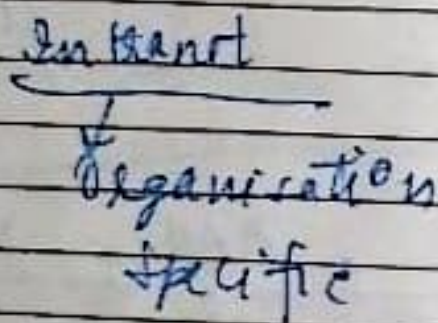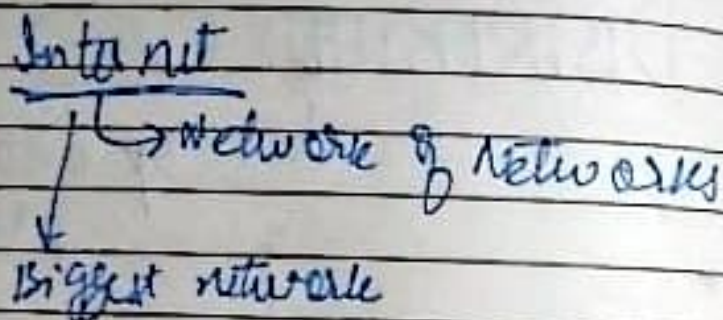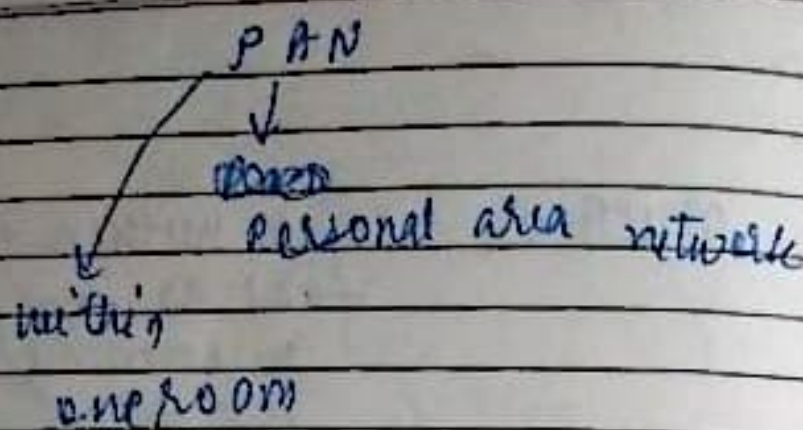
Suppose main

Campus & east

campus.

TCS - all over world

all computers.

✓ Extranet
↓
Some features

by outside world
by registration.

✓ Intranet
↓
online learning

massive
online
course
(MOCs)

Infosys company
computer all
over the world

Intranet
& WAN

Request serve by
nearest server

Advantage → info update
Reliability (backup)
loosely coupled →

(asymetric) — If runs down
it acts as
server

List
Hierarchy — one master process or

Set all slaves
work — gives them
instruction

(Symmetic)
competition

One process keeps eye on rest
three. All keep eye on
each
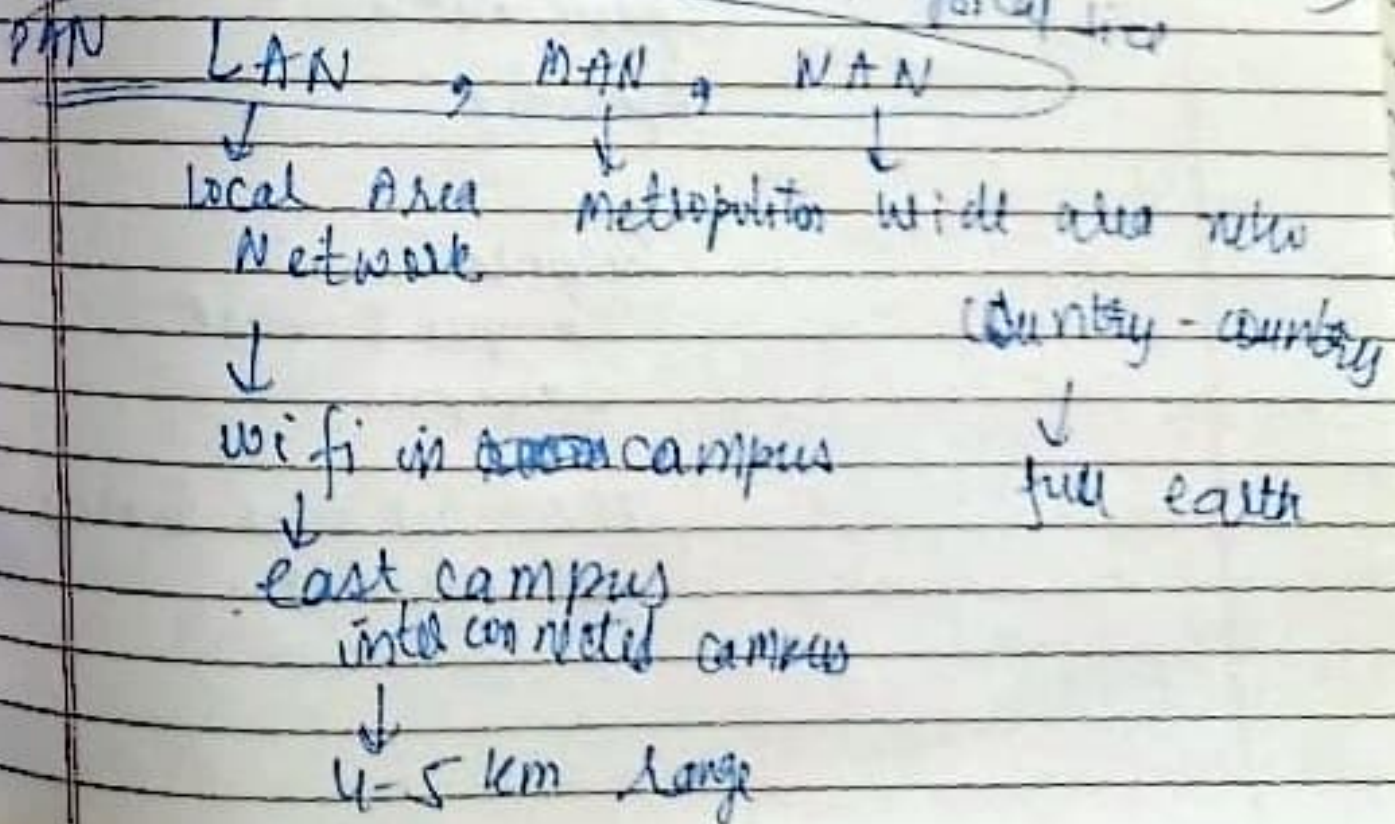So if one goes down
rest share the work.

Multiprocess — All work back
per chip
power consump
is less
Power consumption
is less in multi

Multicore - comm within chip is
fast as compared
to communication
b/w chips (multi
processor)

DISTRIBUTED O.S

↳ up until now
processors work
in one system

⟶ All processors are
separate (In Delhi,
Mumbai, etc.)
physical

PAN   <u>LAN</u> , MAN , WAN

Local Area   Metropoliton   Wide area ntw
Network

↓   Country - country

wifi in campus

↓   ↓
                             full earth
east campus
inter connected campus

↓

4-5 km range

→ Sab apne apne terminal ke saath hai.

– Computation speedup

EMBEDDED OS SYSTEM

↳ In washing
   machine
   ↳ mechanical
   ↳ combn electronic
nucleus   & mechanical
submarine

⚡ combination: Embedded system
                works in real
REAL TIME   time
   ↳ Timer 30sec
     ↳ so it should not
       start after 1 hour
     ↳ Jab kaha tab
        start hua

Rahul
Jim
↓
No
delay th phone
of 1 a use
↓
missile
launch.

Saif
Tim
↓
Florido
↓
call, video play