



SNMV COLLEGE OF ARTS AND SCIENCE

Shri Gambhirmal Bafna Nagar

Malumachampatti,

Coimbatore - 641 050.



CRITERIA 2

2.5.1. Mechanism of internal assessment is transparent and robust in terms of frequency and mode

Orientation on Evaluation Process: Students are made aware of the evaluation process through the following initiatives:-

- The orientation programme conducted for the faculty members at the beginning of the semester by the senior staff and also through the public address system of the college.
- Teaching Plan contains evaluation procedures
- Academic Calendar with CIA test dates
- Orientation on the changes and amendments in the evaluation process through the Tutorial Meetings
- Display of the rules and regulations for conducting examinations and the instructions to the invigilators on the College and Department Notice Boards.

Result Analysis & Review Meeting:

Result Analysis is done by the class tutors after every CIA Test and the Pass percentage of each course is calculated by dividing the total number of students appeared and passed in each course. The performance of the students is monitored by the Principal and the necessary feedback is given to the concerned faculty members. The Principal conducts Review Meetings department wise to give necessary feedback for the improvement of students' performance.



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Questions Responses 74 Settings

Total points: 50

 **SNMV** COLLEGE OF ARTS & SCIENCE AND INSTITUTE OF MANAGEMENT (SHRI NEHRU MAHA VIDYALAYA)
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III - Continuous Internal Assessment Test DEPARTMENT OF COMPUTER SCIENCE- ODD SEM

CLASS : II B.Sc CS DATE : / / 2020 SUBJECT : DATA STRUCTURES SUBJECT CODE: 33A
DURATION : 2 hrs MARKS : 50

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CIA III- DATA STRUCTURES-II A68

Questions Responses Settings Total points: 00

1. The Quick sort algorithm exploits _____ design technique.*

- Dynamic programming
- Backtracking
- Divide and conquer
- Greedy

2. A _____ is just a collection of key values and addresses pairs.*

- Primary key
- Record
- Index
- Query

3. One of the better known methods for searching an ordered sequential file is _____.*

- Linear search
- Sequential search
- Quick search
- Binary search

4. The combination of key values specified for retrieval will be termed as _____.*

- Function
- File
- Query
- Values

Gmail YouTube Reading list

hemalathae122@gmail.com < 28 of 74 > [Print] [Trash]

46 of 50 points Updates made after release [Release score]

III - Continuous Internal Assessment Test

DEPARTMENT OF COMPUTER SCIENCE- ODD SEM

CLASS : II B.Sc CS DATE : / / 2020 SUBJECT : DATA STRUCTURES SUBJECT CODE: 33A
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* Required

Email *

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Accepting responses

Summary Question Individual

dhanyashanmugam632@gmail.com < 13 of 16 > [Print] [Trash]

9 of 50 points [Score not released] [Release score]

CIA II - ADVANCED OPERATING SYSTEMS - II

M.Sc.(CS)

CONTINUOUS INTERNAL ASSESSMENT II

* Required

Email *

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Gmail YouTube

Add individual feedback

✗ 2. Say true or false. "Airlines reservation system is one of the applications of the real time operating system." * 0 / 1

a) True

b) False ✗

Correct answer

a) True

Add individual feedback

✓ 3. Real time operating systems are _____. * 1 / 1

a) small

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✖ 17. a) Explain in detail architecture of android. (or) b) Explain how to secure handheld systems. / 8

✖

Add individual feedback

Upload answer sheet (only PDF FORMAT) * / 0

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Add individual feedback

Submitted 4/27/21, 1:01 PM

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CIA II - AOS - II M.Sc.(CS) (Responses) ☆ 📁 📄

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1	CLASS	REG.NO	SECTION - A (11*1=11)	1. A real-time operating s	2. Say true or false. "Airlr	3. Real time operating sy	4. Real-time ____ scher	5. Real-time system incl	6. ____
2	Msc Computer Science		12	c) real time	a) True	c) small and simple	b) process	a) tasks	a) Sen:
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4	I MSC(CS)	2032k0144		a) virtual	a) True	d) large and complex	a) task	c) calculations	a) Sen:
5	Msc cs	2032k0139		c) real time	b) False	d) large and complex	a) task	a) tasks	a) Sen:
6	I M.Sc.COMPUTER SCI	2032k0147		c) real time	a) True	a) small	a) task	b) programs	c) Inter
7	MSc.cs	2031k0133		c) real time	a) True	c) small and simple	a) task	a) tasks	b) Actu
8	Msc CS	2032k0135		c) real time	b) False	d) large and complex	a) task	a) tasks	a) Sen:
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12	I msc cs	2032k0143		c) real time	b) False	d) large and complex	a) task	a) tasks	a) Sen:
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12) a). Insertion sorting with Algorithm

* The basic step in this method is to insert a record R_i in sequence ordered records R_1, R_2, \dots, R_{i-1} . In such a way the resulting sequence of size $i+1$ is also ordered.

Algorithm :-

Insertion sort

procedure INSERT (R, P)

 $j \leftarrow i$ while $k < k_0$; do $R_{j+1}^o \leftarrow R_j^o$; $j \leftarrow j - 1$

end

 $R_{j+1}^o \leftarrow R$

end INSERT.

procedure INSERT (R, n)

 $k_0 \leftarrow -\infty$ // create dummy records R_0 .for $j \leftarrow 2$ to n do.

$T \leftarrow R_j$

call INSERT (T, j-1)

end

end INSERT.

⑤

Analysis of Insertion sort :-

* The computing time for insertion sort is $O(t)$ and it results in overall worst case time $O(n^2)$.

* The record R_i is left out of order.

(200) if $R_i < \max_{j \leq i} \{R_j\}$

* If R is a number of records left out of order then the computing time is $O(R + 1 \times n)$.

13) b) a heap sort with algorithm :-

* A heap is defined to complete binary tree with the property that the value of each node at least as large as the value of its children node.

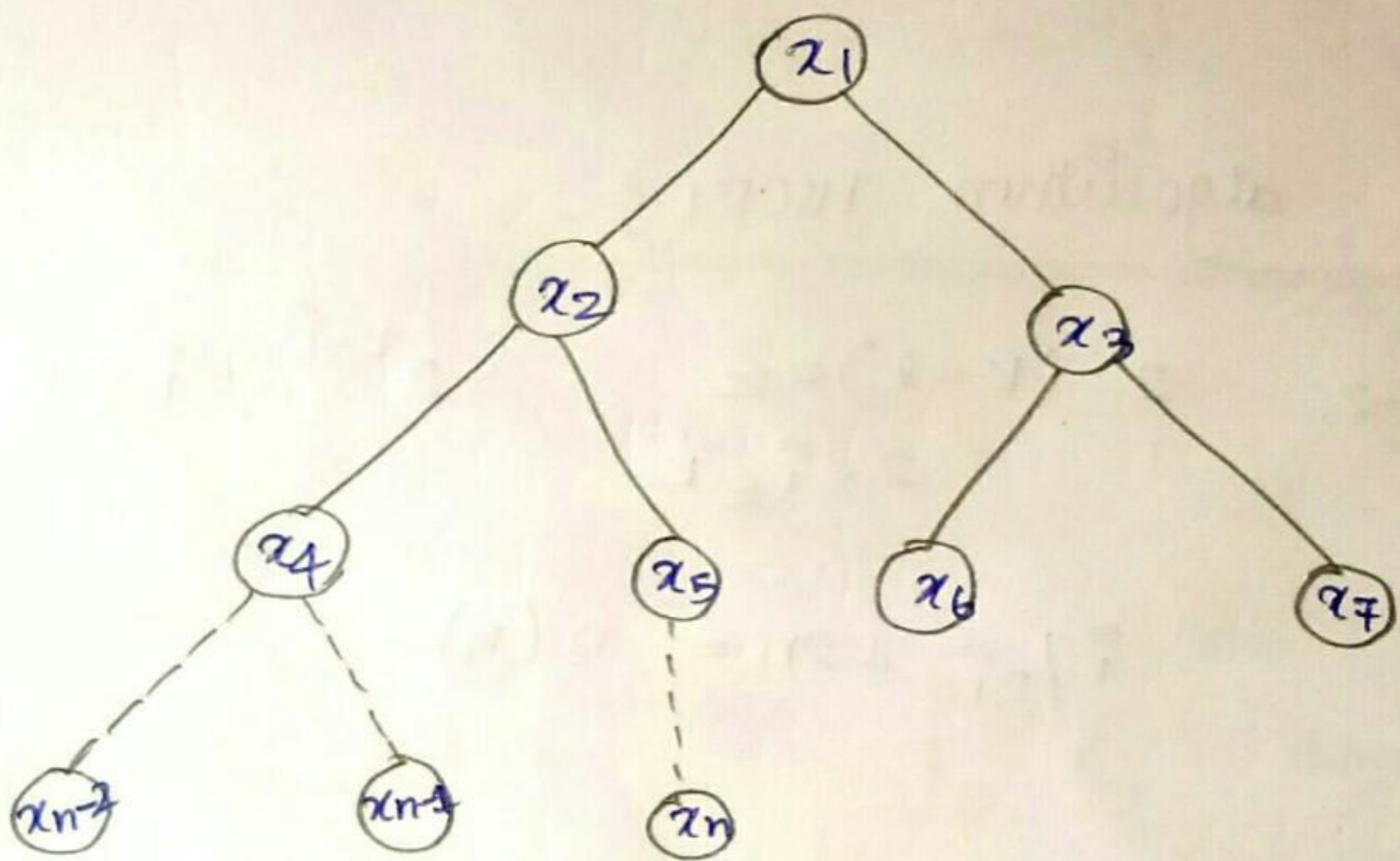
* A heap sort may be regarded as

two stage method

E. HEMALATHA
1922K1862

* The tree representation of the file is $\textcircled{3}$ converted into heap.

* The computation time $O(n \log n)$ both in worst case and has average behaviour requires additional storage proportion to number of records in the file being sorted.



Algorithm :-

procedure

$R \leftarrow R^i$; $K \leftarrow K^i$; $J \leftarrow 2^i$

while $J \leq n$ do

if $J < n$ and $K_J^i < K_{J+1}^i$ then $J \leftarrow J+1$.

if $K \geq K_J^i$ then $R_{J/2}^i \leftarrow R_J^i$ [setween]

$R_{J/2}^i \leftarrow R_J^i$; $J \leftarrow 2$.

end
end ADJUST $R_j/2 \leftarrow R$.

procedure HSORT (R, n)

for $i \leftarrow n/2$ to 1 by -1 do

call ADJUST (i, n)

end

for $i \leftarrow n-1$ to 1 by -1 do

$T \leftarrow R_{i+1}$; $R_{i+1} \leftarrow R_i$; $R_i \leftarrow T$

end

end HSORT.

Analysis of algorithm HSORT :-

$$0 \leq i \leq k-2 \quad 2^i (k-i) = \sum_{2 \leq i \leq k} 2^{k-i}, \quad i \leq n.$$

$$\sum_{2 \leq i \leq k} i/2^i < 2n = O(n)$$

14) Inverted files :-

Inverted files are similar to multi list. The difference in multilist records with the same key value are linked together with link information being kept in individual records in the case of inverted. In this link information is kept in index itself.

F. HENALATHA
1922K1862

(B)

E # index

510	B
620	E
750	D
800	C

occupation index.

analysis	B, C
program	A, D, E

Salary Index.

900	E
12000	C, D
10,000	A
15000	B

set index.

F	B, C, D
H.	A, E.

A, B, C, D, E → address of records.

cellular partition.

* In order to reduce file such time the storage media which are divided in the cell. It may be can entire disk pack or it may be simply as cylinder.

* List are located within cell. The index entry for program PROG will contain several entries of the type (ADDR, length), where ADDR is a pointer to start a list of records and length is a number of records on the list.

Section - C

⑥

15) a) The 2-way merge with its

algorithm :-

At merge sort algorithm to sort n records in which one way merge to files $(x_1 \dots x_m)$ and $(x_{m+1} \dots x_n)$ which are sorted to get third file as $(z_1 \dots z_n)$.

Algorithm :-

procedure MERGE

$k \leftarrow k + 1$ ($i, j \leftarrow m+1$)

while $i \leq m$ and $j \leq n$ do

if $x_i < x_j$ then [$z_k \leftarrow x_i, i \leftarrow i+1$]

else [$z_k \leftarrow x_j, j \leftarrow j+1$].

$k \leftarrow k+1$

end

if $i > m$ then $(z_k \dots z_n) \leftarrow (x_j \dots x_n)$

else $(z_k \dots z_n) \leftarrow (x_i \dots x_m)$

end MERGE

Internal sorting :-

⑦.

A procedure MPASS. This algorithm performs on pass of merge sort. It merges adjacent of sub size of length. x_1 file x_2 file while n is the number of records in x .

Algorithm :-

```

procedure MPASS (x, y, n, c)
  p ← 1
  call MERGE (x, p, p+1, p-1, p-2l-1, y)
  p ← p+2l
end
if p+1 ≤ n then call MERGE (x, p, p+1-1, n, y)
else (y...yn) ← (x1...xn)
end MPASS.

```

The merge sort algorithm is takes of all algorithm.

```

procedure MSORT (m, n)
  p ← 1
  while l < n do
    call MPASS (x, y, n, l)

```

$p \leftarrow 2 * l$

call NPASS (y, x, n, l) // Inter change
value of x, y.

⑧.

$l \leftarrow 2 * l$

end

end NSORT.

* Procedure RMSORT (X, l, u, P)

if ($l \geq u$ when $P \leftarrow l$)

else [mid $\leftarrow l + (u - l) / 2$]

call RMSORT (X, l, mid, 2)

call RMSORT (X, mid + 1, u, 2)

call RMERGE (P, a, R).

end RMSORT.

* Procedure RMERGE (X, Y, Z)

$i \leftarrow x$; $j \leftarrow y$; $z \leftarrow do$

while $i \neq 0$ and $j \neq 0$ do

if KEY (i) \leq KEY (j) then

[LINK (z) \leftarrow i, $z \leftarrow i$, $j \leftarrow$ LINK (j)]

else [LINK (z) \leftarrow j, $z \leftarrow j$; $i \leftarrow$ LINK (i)]

end

if $i = 0$ then LINK (z) \leftarrow j

else LINK (z) \leftarrow i

$z \leftarrow$ LINK (z)

end RMERGE.

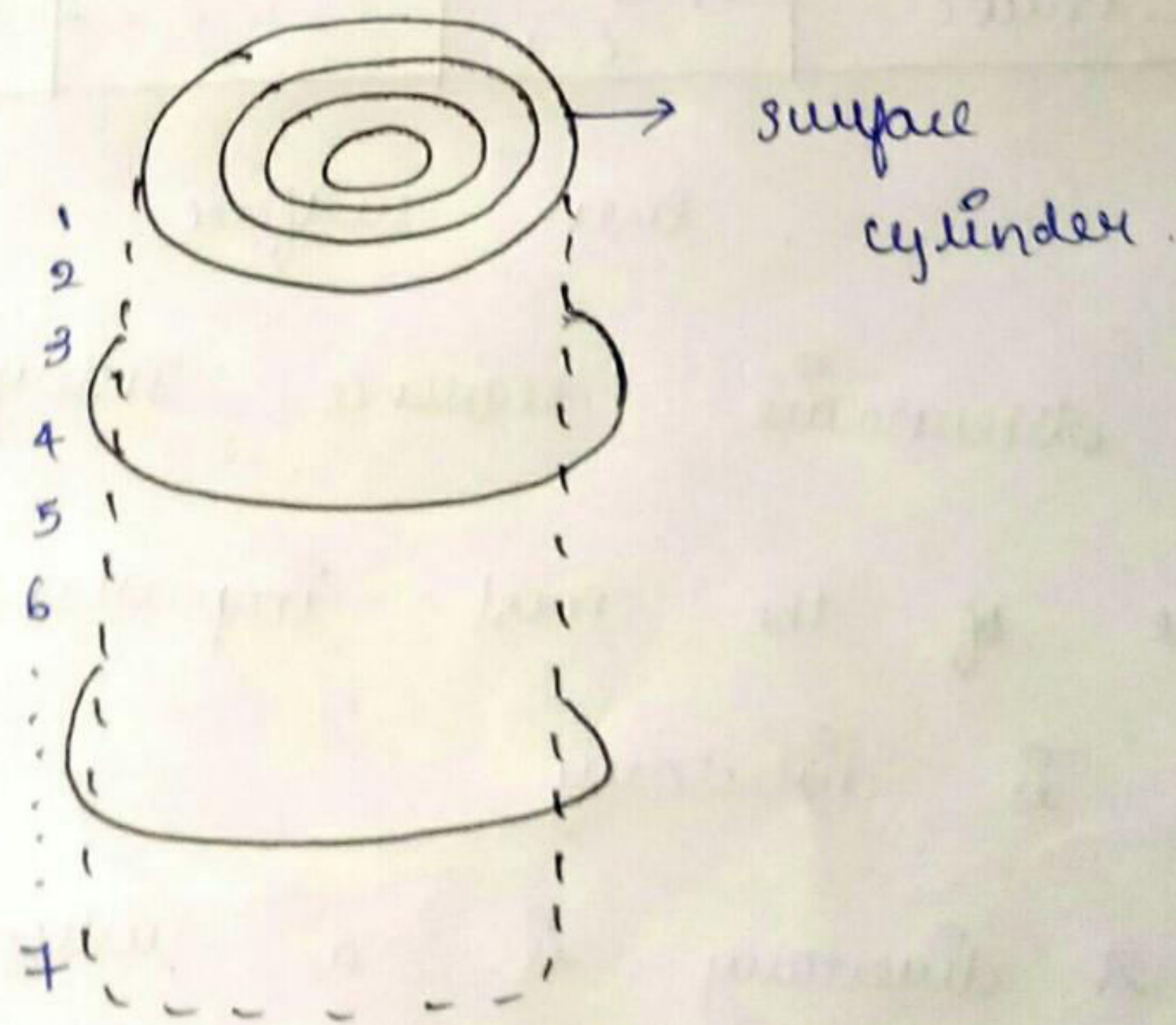
⑨.

1b) b) cylinder - surface indexing :-

* It is the simplest type of index organization, which is useful only for primary key index of a sequential ordered files.

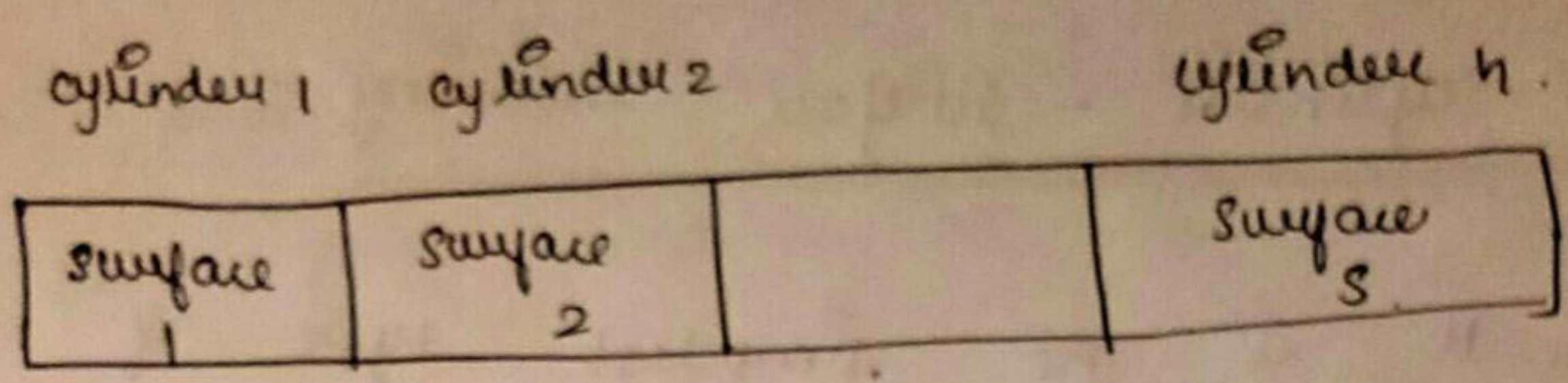
* Index consist of cylinder index and surface index.

* The total number of surface index entry can be denoted as CS .

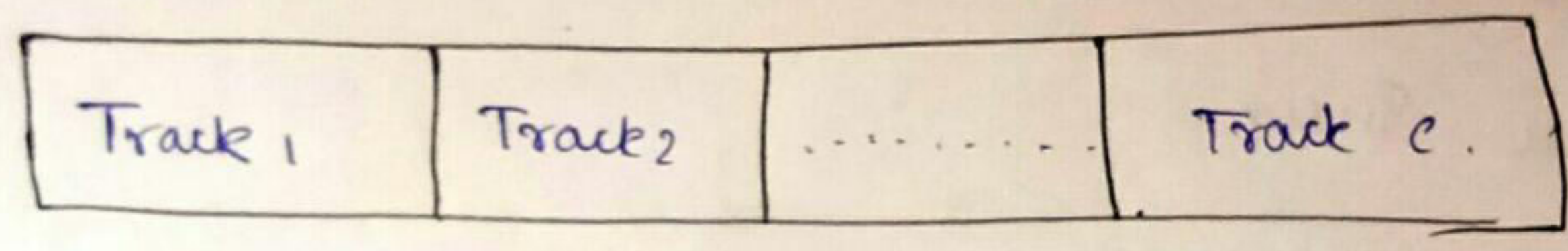
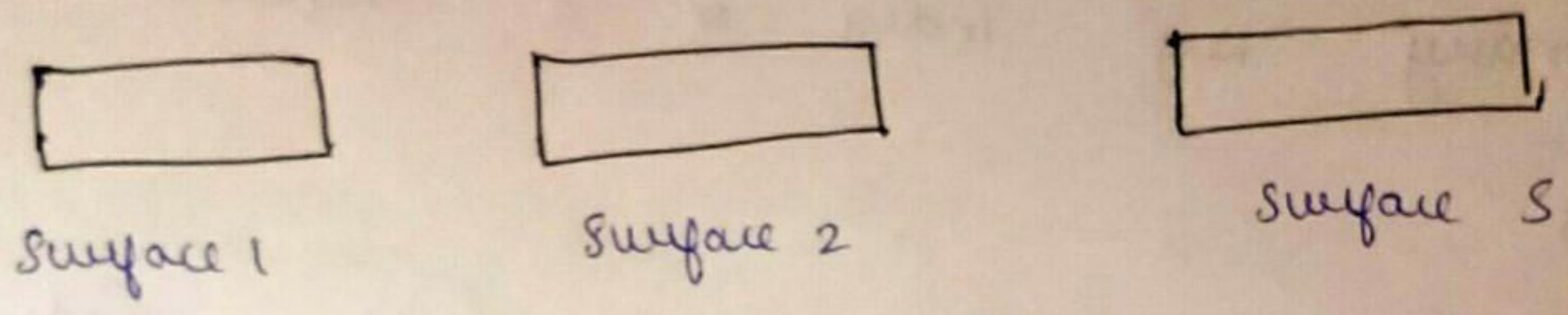


sequence of cylinder.

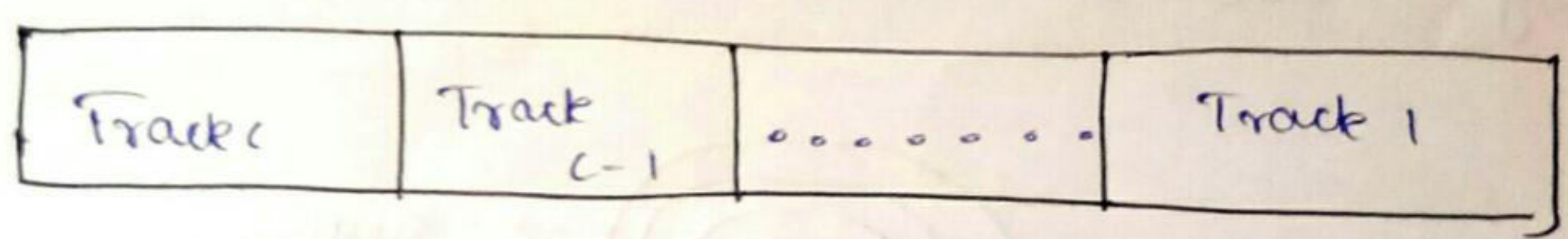
(10)



Sequence within cylinder.



odd surface



even surface

Alternative sequence Interpreter

* One of the most important component of file is directory.

* A directory is a collection of indexes. The directory may contain one index for

every key or may contain an
Index for only same type of keys.

* The Indexes may be dense or non-dense.

Pseudocode NSEARCH (T, X)

1. $P \leftarrow T^0$; $K_0 \leftarrow [-x]$; $\theta \leftarrow 0$
2. while $P \neq 0$ do
3. Input node P from Link
4. Let P define n , $A_0, (K, A) \dots (K_n, A_n)$
5. $K_{n+1} \leftarrow [+x]$.
6. Let P define such that

$$K_j^0 \leq x < K_j^0 + 1.$$
7. if $x = K_i$ then
8. $A \leftarrow P^0$; $P \leftarrow A^0$;
9. end
10. return $(A, P, 0)$.
11. end NSEARCH.

Pseudocode for Insertion

(19)

Pseudocode INSERT B (T, x)

 $A \leftarrow 0, K \leftarrow 2$ $(P, j, P) \leftarrow \text{NSEARCH}(T, x)$ if $j \neq 0$ then return.while $P \neq 0$ do insert (K, x) into position if $n \leq m-1$ then let $P \& P'$ be defined output $P \& P'$ on disk. $K \leftarrow K \lceil m/2 \rceil, A \leftarrow P'$; $P \leftarrow \text{PARENT}(P)$

end.

17) a). file organizations.Sequential organization :-

* The problem associated with sequential organization scheme is discussed. The most popular organization scheme in which cylinder surface

is maintained for the primary

(13)

Key.

* In order to get efficient records based on other tree it is necessary to maintain additional indexes on remaining key.

Advantages :-

- i) Simple to design
 - ii) easy to program
 - iii) variable length and blocked record.
- all available.
- iv) Best way to use as storage space.

Disadvantages

* Records cannot be added at the middle of the file.

Random organization :-

* In this organization records are stored at random location on disk. direct addressing.

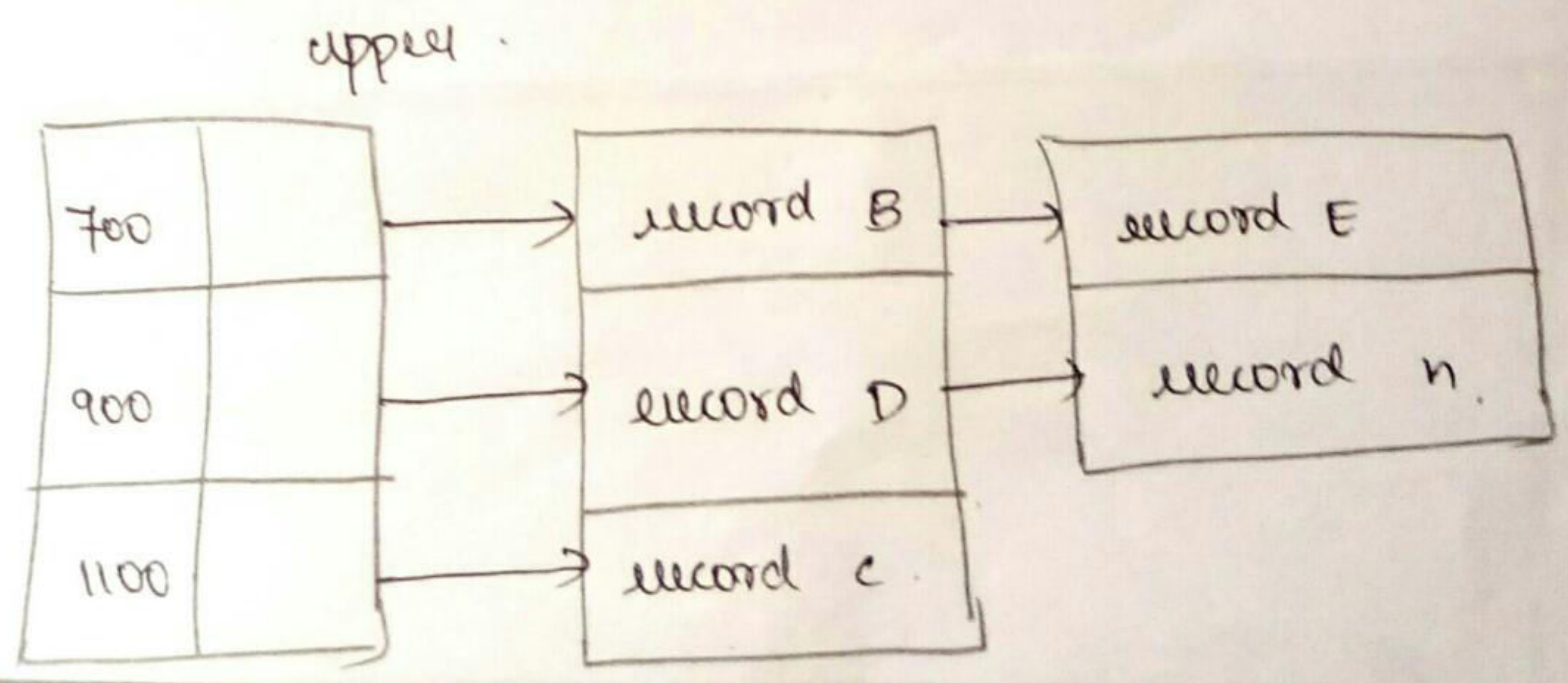
* In direct addressing with equal.

Size records the available disk space is divided into nodes not enough to hold the record. The value of primary key is used to determine which a particular record is stored no index or storing key is needed.

Linked Organization :-

* It is different from sequential organization in the logical sequence of records which is different from physical sequence.

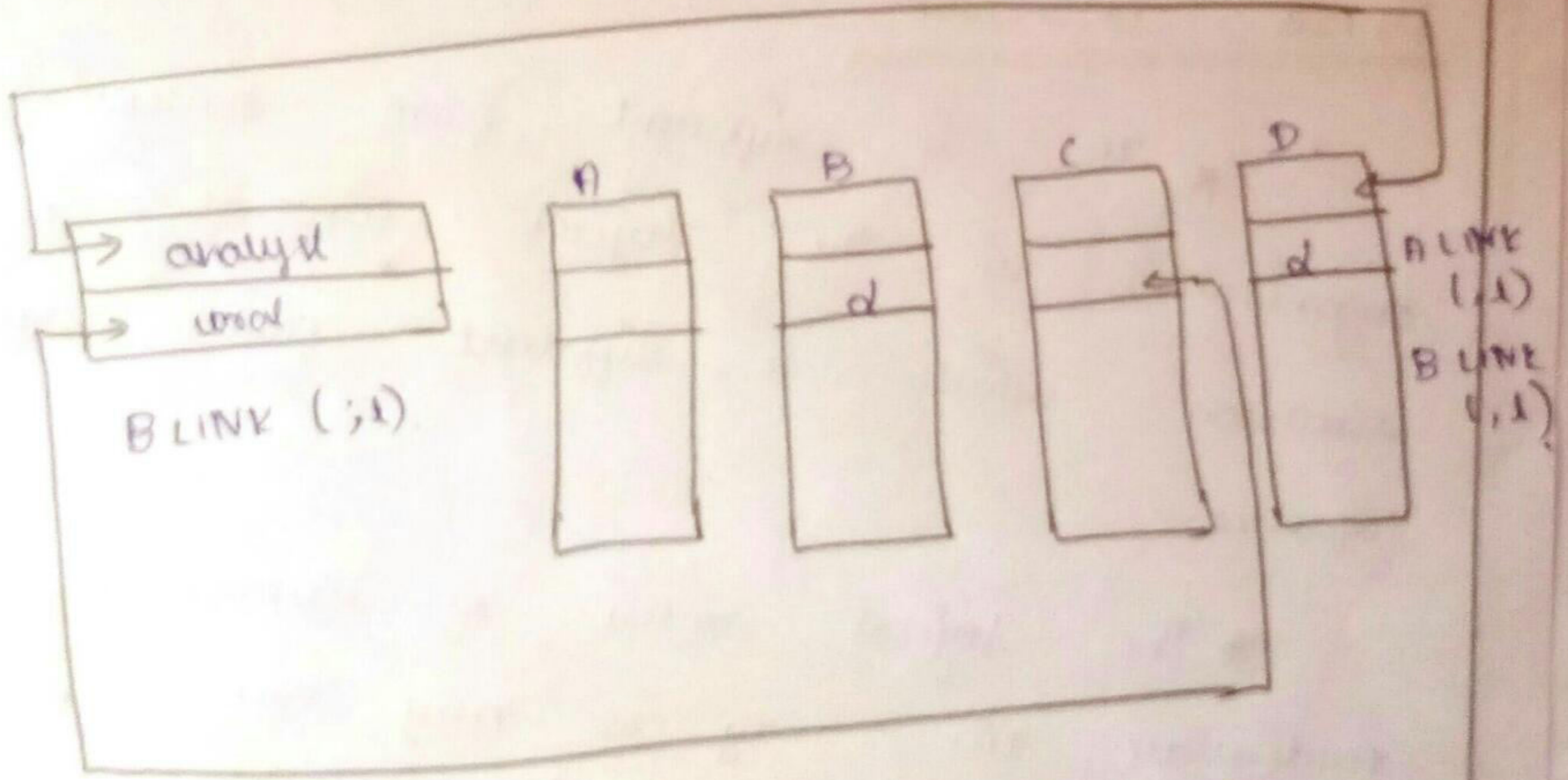
* The logical order of records in any particular list may or may not depend on application.



* A word using structure is an adaptation of doubly linked list structure.

* The link fields such as A LINK (y, i) and B LINK (y, j) are used.

* The A LINK field is used to link together all words with same value key for k^i .



d = head node for analyst runs.

Reg. No: 2032K0115

Name: G. Dhanya.

Class: I MSc [CS]

Subject: Advanced Operating System.

Date: 27-04-2021.

Section-B

12. a) Real time operating system.

* The Real time operating system is high Integrity system, describes a RTOS. known as software component that rapidly switches between individual programming threads.

* Real time operating system is external operating system with death line.

* Most RTOS use a pre-emptive scheduling algorithm.

Example:

* personal computer operating system = Microsoft windows, Mac OS X, Linux.

* Apple mobile phone operating system = iPhone OS.

* Mobile phone operating systems = Android, Blackberry, Web OS, Microsoft windows

* Tablets & laptops operating system = Microsoft windows, MacOS X, Apple iOS, Google, HP, Blackberry.

* There are a number of different types of OS, They include:

- ⇒ Multi-user
- ⇒ Multiprocessing
- ⇒ Multitasking.
- ⇒ Multithreading
- ⇒ Real-time.

Advantages of Real-time OS:

high integrity system state there are a number of advantages.

- ⇒ Priority Based scheduling.
- ⇒ Abstracting Timing Information.
- ⇒ Maintainability/Extensibility
Modularity
- ⇒ Promotes Team Development
- ⇒ Easier Testing
- ⇒ Code Reuse
- ⇒ Improved Efficiency.

Disadvantages of Real-time OS:

There are various reports written about the Disadvantages.

- ⇒ Limited Tasks
- ⇒ Use heavy system resources
- ⇒ Complex Algorithms
- ⇒ Device driver & interrupt signals
- ⇒ Thread priority.

b) handheld operating systems:

* Since the development of handheld computers in the 1990's the demand for software to operate and run on these devices has increased.

* Three major competitors have emerged in the handheld pc world with three different operating systems for these handheld pc's.

* One of the first of these three companies was the palm corporation with their palm OS.

* Microsoft also released what was originally referred to as window CE.

* Microsoft recently released OS for the handheld pc are now under the name of pocketpc.

handheld operating systems Different from Desktop operating system:-

* Since handheld operating systems are designed to run on machines that have lower speed processors and less memory.

* They were designed to use less memory & require fewer resources.

* handheld OS are also designed to work with different types of hardware

* Than standed desktop operating system.

This is because the power requirement for standard cpu's and memory for exceed the power that handheld devices.

* handheld devices aren't able to dissipate the large amounts of heat generated by standard cpu's either.

* Many handheld devices rely on flash memory cards for their internal memory as large hard drives could not fit into handheld devices.

Types of handheld operating system:

- ⇒ palm operating system.
- ⇒ pocket pc
- ⇒ Symbian operating system.
- ⇒ Linux operating system.
- ⇒ windows
- ⇒ Android.

14. a) palm operating system:

* Created in 1996 by palm Incorporated and alternatively known as Garnet OS, palmOS is the operating system used by the stylus based palmpilot series of handheld computers.

* The 6th & final update to the operating system, palm OS cobalt, was released in 2004.

Features of palm OS:-

* The initial version of palm OS included the following features:

- ⇒ Address book
- ⇒ Data book
- ⇒ Notepad
- ⇒ To-do list
- ⇒ Calculator.

* Features added in the various updates to palm OS include the following.

- ⇒ Infrared messaging
- ⇒ Color display
- ⇒ Bluetooth
- ⇒ Wi-fi.

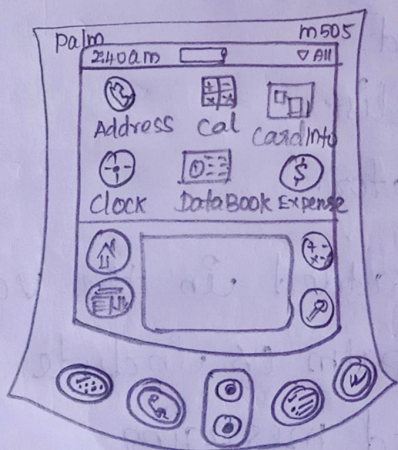
* palm os is discontinued mobile operating system initially developed by palm, Inc.

* palm os was designed for ease of use with a touchscreen-based graphical user interface.

* It is provided with a suite of basic application for Personal Information Management.

* later versions of the os have been extended to support smartphone.

* several other licenses have manufactured devices powered by palm os.



source model - closed-source.

platforms - ARM

Motorola 68k.

Section - c

15. a) Basic Model of a Real-time System:

* Real time system is a system that is used for performing some specific tasks.

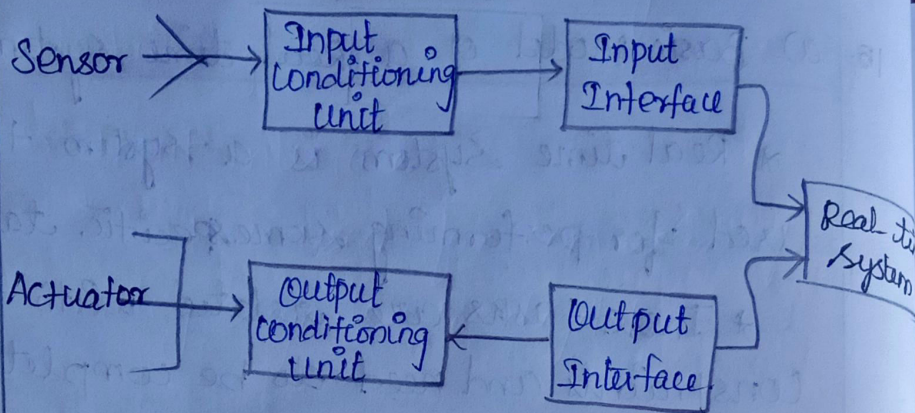
* These tasks are related with time constraints and need to be completed in that time interval.

* The basic model of a Real-time System presents the overview of all the components involved in a real-time system.

* Real-time system includes various hardware & software embedded in a such a way that the specific tasks can be performed in the time constraints allowed.

* The accuracy and correctness involved in real-time system which are more complex and are hard to understand.

* Here we will discuss basic model of real-time system which has some commonly used terms and hardware.



Sensor:-

* Sensor is used for the conversion of some physical event or characteristics into the electrical signals.

* There are hardware devices that takes the input from environment & gives to the system by converting it.

Actuator:-

* Actuator is the reverse device of sensor.

* Where sensor converts are physical event into electrical signals, actuator does the reverse.

* It takes the inputs from the output interface of the system:

Signal conditioning unit:

* When the sensor converts the physical actions into electrical signals, then computer can't use them directly.

* Hence, after the conversion of physical action into electrical signals, they need conditioning.

* There are two types:

⇒ Input conditioning unit:

It is used for conditioning the electrical signals coming from sensor.

⇒ Output conditioning unit:

It is used for conditioning the electrical signals coming from the system.

Interface unit:

* Interface units are basically used for the conversion of digital to analog and vice-versa.

* Signals coming from the input conditioning unit are analog and the system does the operations on digital signal only, then the interface unit is

used to change the analog signals to digital signals.

→ Input Interface:

It is used for conversion of analog signals to digital.

→ Output Interface:

It is used for conversion of digital signals to analog.

16. a) Characteristics of Real-time systems:

Real-time system:

* This system that is put through real time which means response is obtained within a specified timing constraint or system meets the specified deadline.

* Real-time system of two types.
Hard & soft.

* Hard real time system different cases

* Hard real time system are used where even the delay of some nano

or micro seconds are not allowed.

- * Soft real time system provide some relaxation in time expression.

Characteristics of Real-time system:

Following are the some of the characteristics of real-time system.

Time constraints:

- * Time constraints related with real-time system simply means that time interval allotted for the response of the ongoing program.

- * Real-time system is responsible for the completion of all tasks within their time intervals.

Correctness:-

- * Correctness is one of the prominent part of real-time system.

- * Real-time system produce correct result within the given time interval.

- * In real-time systems, correctness of result is to obtain correct result in time constraint.

Embedded:

* All the real-time systems are embedded now-a-days.

* Embedded system means that combination of hardware and software designed for a specific purpose.

Safety:

* Safety is necessary for any system but real-time systems provide critical safety.

* Real-time system also can perform for a long time without failures.

Concurrency:

* Real-time systems are concurrent that means it can respond to a serial number of processes at a time.

* This makes the real-time system concurrent system.

Distributed:

* In various real-time systems, all the components of the system are connected in distributed way.

* Thus all the operations of real-time system are operated in distributed ways.

Stability:

* Even when the load is very heavy, real-time system respond the time constraint, Real-time systems does not delay the result of tasks even when there are several task going on a same time.

* This brings the stability in real-time system.

17. a) Android Architecture:-

* Android Architecture is a software stack of components to support mobile devices needs.

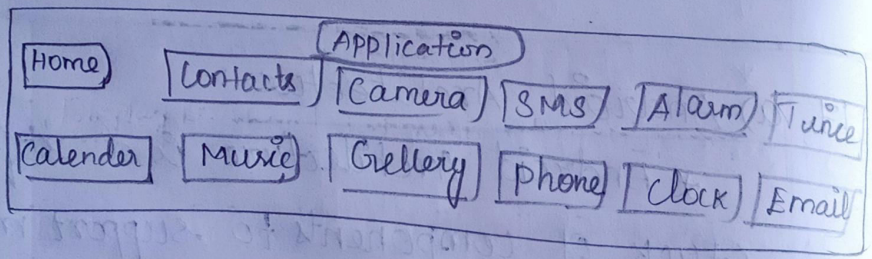
* Android software stack contains a Linux kernel, collection of C/C++, application framework services, runtime and application.

* following are main components of android architecture these are.

- * Applications
- * Android Framework
- * Android Runtime
- * Platform Libraries
- * Linux kernel.

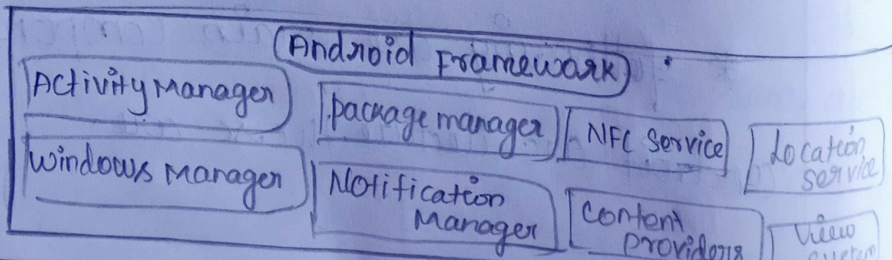
Applications:

- * The top layer of the Android architecture is Applications.
- * The native & third-party applications like contacts, Email, music, gallery, clock, games.



Android Framework:

- * The application framework provides the classes used to create Android applications.
- * It also provides a generic for hardware access & manages the user interface & application resources.

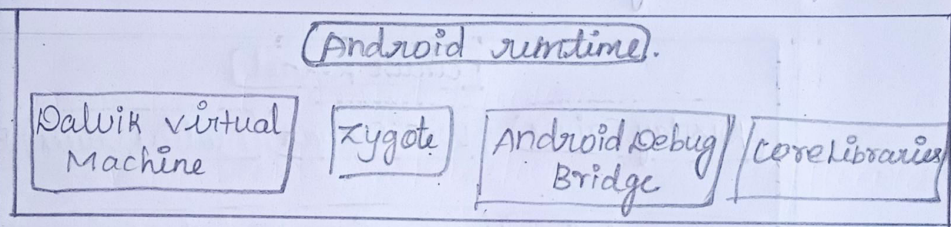


Android Runtime:

* Android Runtime environment is an important part of Android rather than an internal part and it contains components like Core Libraries, Dalvik Virtual Machine.

* DVM - Dalvik Virtual Machine. is a resisted based virtual machine like Java ~~VM~~ virtual machine (JVM).

* The core libraries in android runtime will enable us to implement android application using standard Java programming language.



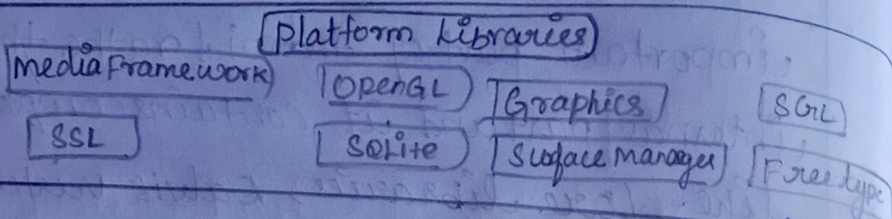
Platform Libraries:-

* The platform libraries includes various C/C++ core libraries and Java-based libraries such as SSL, libc, Graphics, SQLite, webkit, media, surface manager, OpenGL,

⇒ Media Library for playing and recording audio and video formats.

⇒ The surface manager library to

provide a display management.



Linux kernel:-

* Linux kernel is bottom layer and heart of the android architecture.

* It manages all the drivers such as display drivers, camera drivers, Bluetooth drivers, audio drivers, memory drivers, etc..

