Name: Parth Dali
Class: IT A
Roll No: 19
Pid: 191027
Subject: Unix Lab
Exp 1 a

Experiment – 1A: Study of UNIX Operating System.

1. **Aim:** To study UNIX Operating System**.**

2. **Objectives:** After study of this experiment, the student will be able to
   - Understand what UNIX operating systems are.
   - Identify the variants of the UNIX operating system.

3. **Outcomes:** After study of this experiment, the student will be able to
   - Understand the UNIX operating system. (L402.4)

4. **Prerequisite:** None.

5. **Requirements:** Personal Computer, Microsoft Word, Internet Connection.

6. **Pre-Experiment Exercise:**

Brief Theory:

Operating System:

An operating system(OS) acts as an interface between the computer user and computer hardware. It manages the computer hardware and provides a basis for application programs. Some operating systems are designed to be **convenient**, others to be **efficient**, and others some combination of the two.

There are many operating systems currently in use, mainly for desktop PCs, server computers, embedded systems and mobile phones. The popular ones are Windows, Linux, UNIX, Macintosh, WinCE and Android operating systems.

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7. Laboratory Exercise

A. Procedure:

i. What is the UNIX Operating system (OS)?

Ans: UNIX is an operating system which was first developed in the 1960s, and has been under constant development ever since. By operating system, we mean the suite of programs which make the computer work. It is a stable, multi-user, multi-tasking system for servers, desktops and laptops. UNIX systems also have a graphical user interface (GUI) similar to Microsoft Windows which provides an easy to use environment. However, knowledge of UNIX is required for operations which aren't covered by a graphical program, or for when there is no windows interface available, for example, in a telnet session.

ii. History of UNIX OS.

Ans: The origins of Unix date back to the mid-1960s when the Massachusetts Institute of Technology, Bell Labs, and General Electric were developing Multics, a time-sharing operating system for the GE-645 mainframe computer. Multics featured several innovations, but also presented severe problems. Frustrated by the size and complexity of Multics, but not by its goals, individual researchers at Bell Labs started withdrawing from the project. The last to leave were Ken Thompson, Dennis Ritchie, Douglas McIlroy, and Joe Ossanna, who decided to reimplement their experiences in a new project of smaller scale. This new operating system was initially without organizational backing, and also without a name. The new operating system was a single-tasking system. In 1970, the group coined the name *Unics* for *Uniplexed Information and Computing Service* as a pun on *Multics*, which stood for *Multiplexed Information and Computer Services*. Brian Kernighan takes credit for the idea, but adds that "no one can remember" the origin of the final spelling *Unix*.

iii. Flavours of UNIX OS.

Ans: Definition of Flavors: Unix is not a single operating system. It is in fact a general name given to dozens of o.s. by different companies, organizations or groups of individuals. These variants of unix are referred to as flavors. Linux is often considered a unix flavor. The list of unix flavors:

1. AIX : AIX is the commercial version of unix product IBM.

2. BSD : Berkeley Software Distribution.

3. Caldera : The Caldera Open UNIX 8 deployment platform uses Linux Kernel Personality (LKP)

4. FreeBSD : FreeBSD makes a great internet server Or firewall, and recent advancements make freeBSD powerful multimedia editing workstation.

5. HP-UX : HP-UX was the first Unix to use access control lists for file access permissions.

6. Solaris : Solaris is the unix flavor produced by Sun Microsystems.

7. Linux : Linux has generated more excitement in the computer field than any other development.

Linux flavors : Red-hat, Fedora, SUSE, Slackware, Gentoo, Debian, mandrake.

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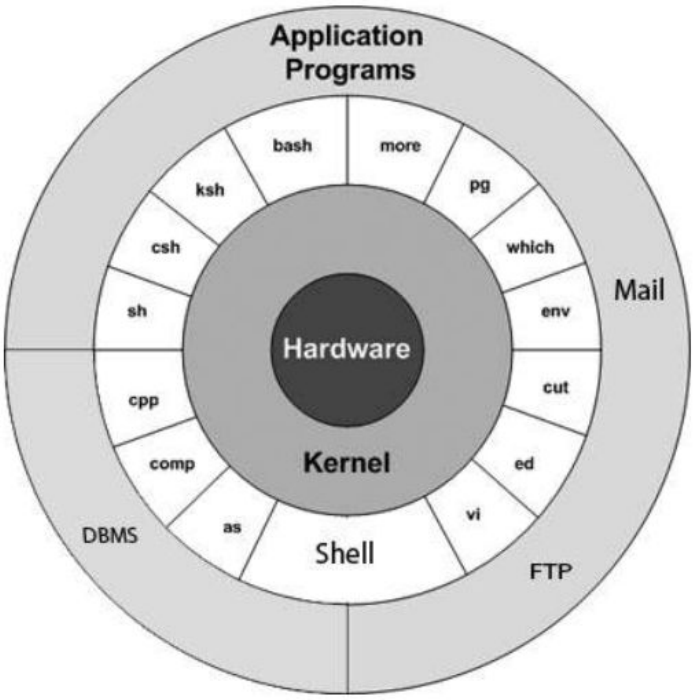
iv. Architecture of UNIX OS.
Ans:

Here is a basic block diagram of a Unix system −



The main concept that unites all the versions of Unix is the following four basics −

- Kernel − The kernel is the heart of the operating system. It interacts with the hardware and most of the tasks like memory management, task scheduling and file management.
- Shell − The shell is the utility that processes your requests. When you type in a command at your terminal, the shell interprets the command and calls the program that you want. The shell uses standard syntax for all commands. C Shell, Bourne Shell and Korn Shell are the most famous shells which are available with most of the Unix variants.
- Commands and Utilities − There are various commands and utilities which you can make use of in your day to day activities. cp, mv, cat and grep, etc. are few examples of commands and utilities. There are over 250 standard commands plus numerous others provided through 3rd party software. All the commands come along with various options.
- Files and Directories − All the data of Unix is organized into files. All files are then organized into directories. These directories are further organized into a tree-like structure called the filesystem.

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v. Advantages of UNIX OS.

Ans: The Advantages of Unix OS are:

- Full multitasking with protected memory. Multiple users can run multiple programs each at the same time without interfering with each other or crashing the system.
- Very efficient virtual memory, so many programs can run with a modest amount of physical memory.
- Access controls and security. All users must be authenticated by a valid account and password to use the system at all. All files are owned by particular accounts. The owner can decide whether others have read or write access to his files.
- A rich set of small commands and utilities that do specific tasks well -- not cluttered up with lots of special options. Unix is a well-stocked toolbox, not a giant do-it-all Swiss Army Knife.
- Ability to string commands and utilities together in unlimited ways to accomplish more complicated tasks -- not limited to preconfigured combinations or menus, as in personal computer systems.
- A powerfully unified file system. Everything is a file: data, programs, and all physical devices. Entire file system appears as a single large tree of nested directories, regardless of how many different physical devices (disks) are included.
- A lean kernel that does the basics for you but doesn't get in the way when you try to do the unusual.

vi. Disadvantages of UNIX OS.

Ans: The disadvantages of Unix OS are:

- Commands often have cryptic names and give very little response to tell the user what they are doing. Much use of special keyboard characters - little typos have unexpected results.
- To use Unix well, you need to understand some of the main design features. Its power comes from knowing how to make commands and programs interact with each other, not just from treating each as a fixed black box.
- Richness of utilities (over 400 standard ones) often overwhelms novices. Documentation is short on examples and tutorials to help you figure out how to *use* the many tools provided to accomplish various kinds of tasks.

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B. Result/Observation

8. Post-Experiments Exercise

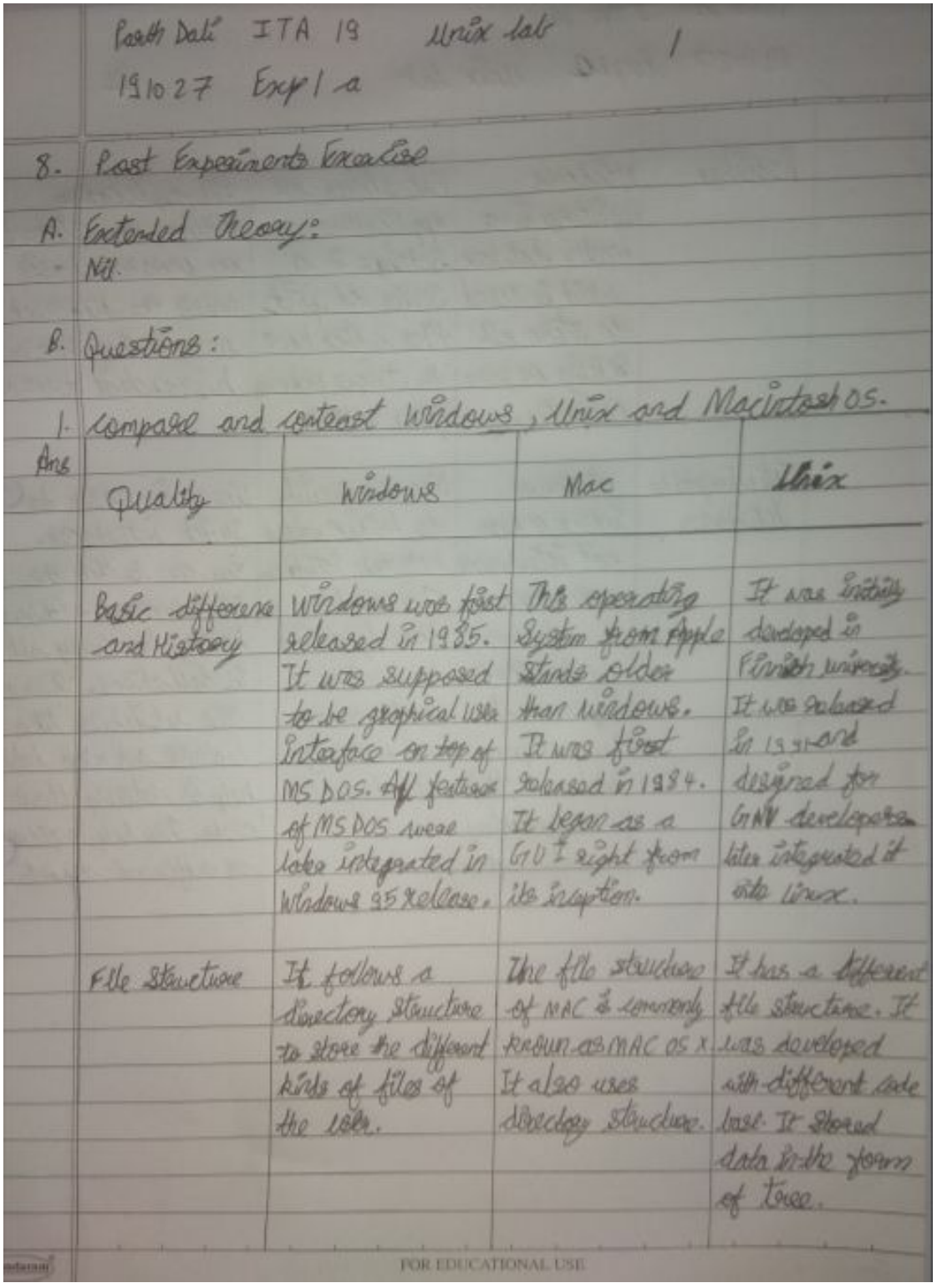
A. Extended Theory:

Nil.

B. Questions:

1. Compare and contrast Windows, UNIX and Macintosh OS.

Ans:



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8. Post Experiments Exercise

A. Extended Theory:
Nil.

B. Questions:

1. Compare and contrast Windows, Unix and Macintosh OS.

Ans

Quality	Windows	Mac	Unix
Basic difference and History	Windows was first released in 1985. It was supposed to be graphical user interface on top of MS DOS. All features of MS DOS were later integrated in Windows 95 release.	The operating system from Apple stands older than windows. It was first released in 1984. It began as a GUI right from its inception.	It was initially developed in Finnish university. It was released in 1991 and designed for GNU developers later integrated it into Linux.
File Structure	It follows a directory structure to store the different kinds of files of the user.	The file structure of MAC is commonly known as MAC OS X It also uses directory structure.	It has a different file structure. It was developed with different code base. It stored data in the form of trees.

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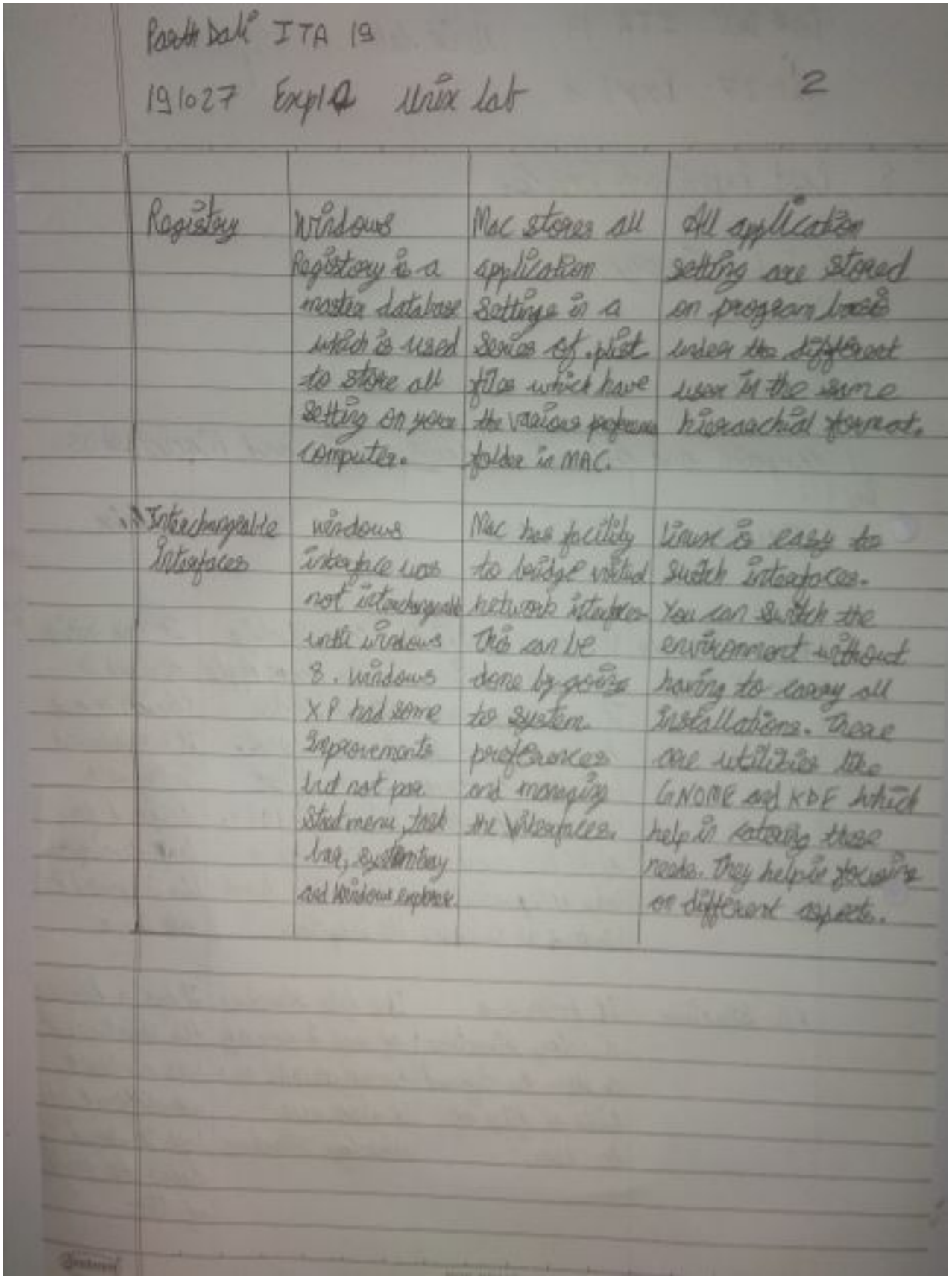

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Registory	Windows Registory is a master database which is used to store all setting on your computer.	Mac stores all application Settings in a series of .plist files which have the various preferences folder in MAC.	All application setting are stored on program basis under the different user in the same hierarchial format.
Interchangable Interfaces	windows interface was not interchangable until windows 8. windows XP had some improvements but not pre. Start menu, task bar, system tray and Windows explorer.	Mac has facility to bridge virtual network interfaces This can be done by going to system preferences and managing the interfaces.	Linux is easy to switch interfaces. You can switch the environment without having to carry all installations. There are utilities like GNOME and KDE which help in storing these needs. They help in focusing on different aspects.

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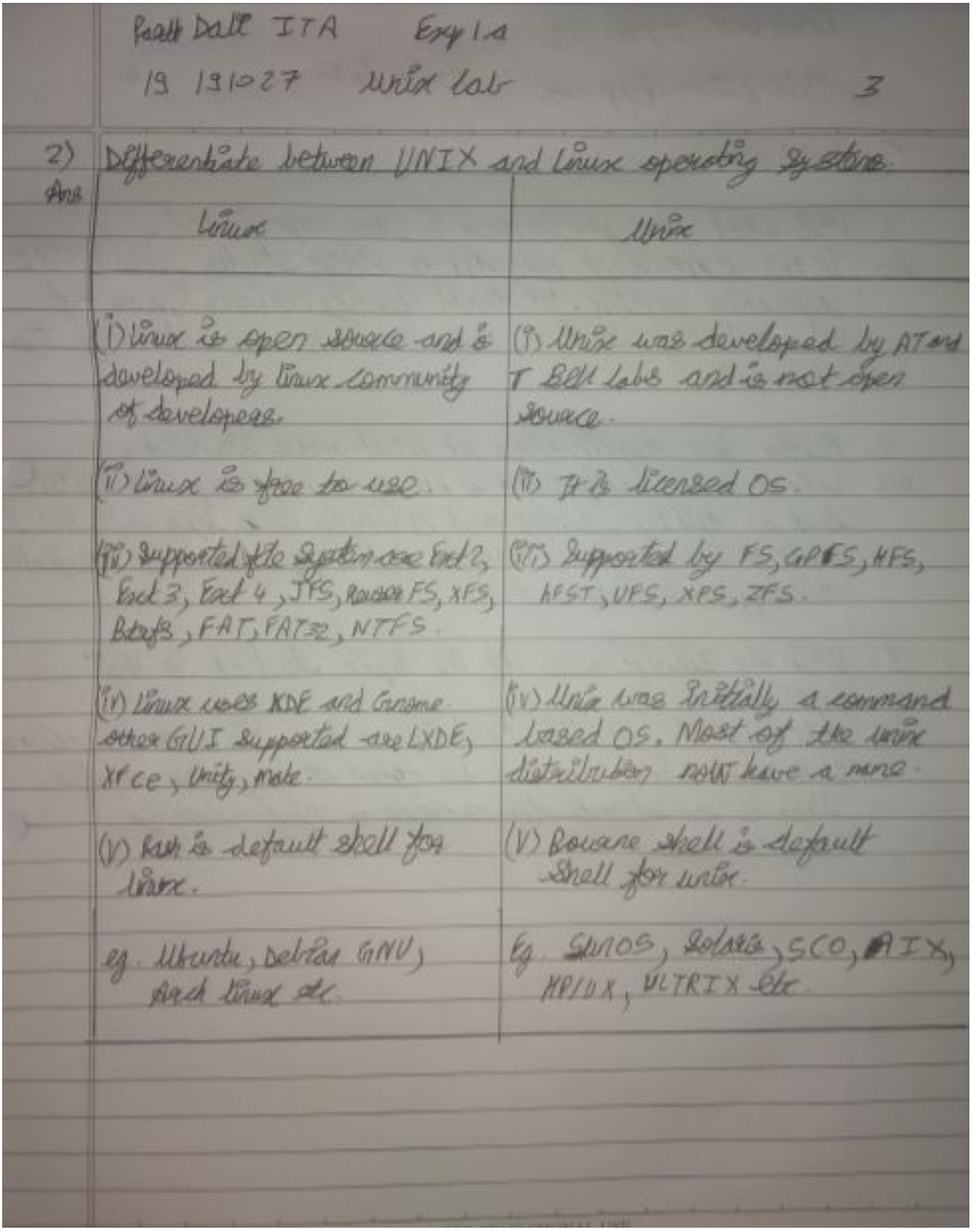
2. Differentiate between UNIX and Linux operating systems.

Ans:



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2) Ans Differentiate between UNIX and Linux operating systems.

Linux	Unix
(i) Linux is open source and is developed by Linux community of developers.	(i) Unix was developed by AT and T Bell Labs and is not open source.
(ii) Linux is free to use.	(ii) It is licensed OS.
(iii) Supported file system are Ext 2, Ext 3, Ext 4, JFS, Reiser FS, XFS, Btrfs, FAT, FAT32, NTFS.	(iii) Supported by FS, GPFS, HFS, HFST, UFS, XFS, ZFS.
(iv) Linux uses KDE and Gnome other GUI supported are LXDE, Xfce, Unity, Mate.	(iv) Unix was initially a command based OS. Most of the unix distributions now have a name.
(v) Bash is default shell for Linux.	(v) Bourne shell is default shell for unix.
eg. Ubuntu, Debian GNU, Arch Linux etc.	Eg. SunOS, Solaris, SCO, AIX, HP/UX, ULTRIX etc.

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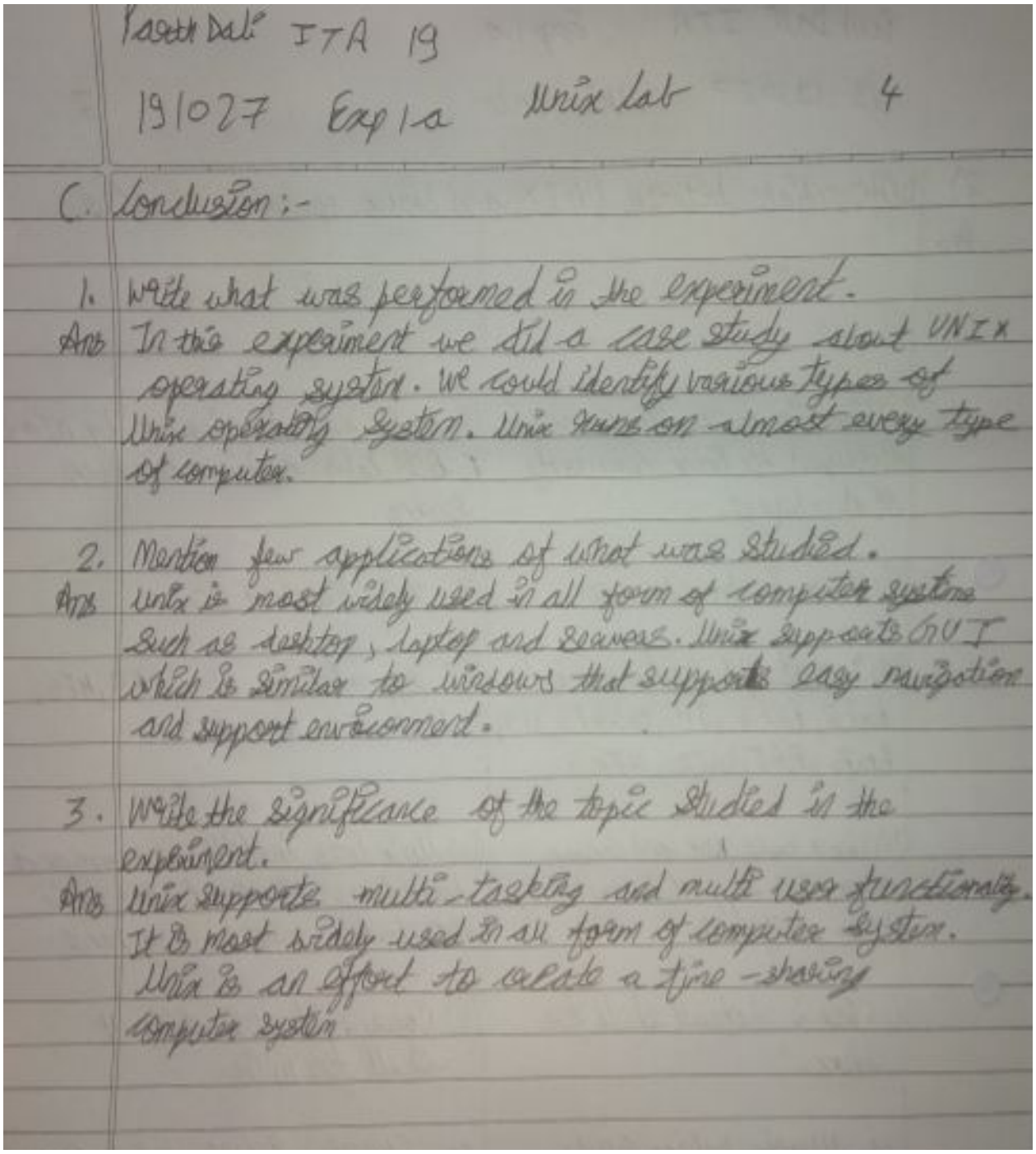
C. Conclusion:

1. Write what was performed in the experiment.
2. Mention a few applications of what was studied.
3. Write the significance of the topic studied in the experiment.

Ans:



D. References:

1. https://www.geeksforgeeks.org/introduction-to-unix-system/.
2. Sumitabha Das, UNIX Concepts and Applications, 3rd Ed., Tata McGraw Hill.