

## **SYSTEM MAINTENANCE LAB**

<b>Subject Code</b> <b>1618508</b>	<b>Practical</b>			<b>No of Period in one session : 60</b>			<b>Credits</b> <b>02</b>
	<b>No. of Periods Per Week</b>			<b>Full Marks</b>		<b>:</b>	
	<b>L</b>	<b>T</b>	<b>P/S</b>	<b>ESE</b>		<b>:</b>	
	—	—	06	<b>TA</b>		<b>:</b>	<b>15</b>
				<b>CT</b>		<b>:</b>	<b>35</b>

### **Rationale & Objective:**

This course will allow the students with hand on experience on various components of the computer system. The student can explore the PC and can learn to troubleshoot the problems and errors of any. The diploma students are expected to learn the basic of various component and there interconnection and troubleshooting, through this course.

<b>List of Experiments:</b>			
<b>Contents : Practical</b>		<b>Hrs/week</b>	<b>Marks</b>
<b>Unit -1</b>	To identify various components, devices and section of PC	(04)	
<b>Unit -2</b>	To study motherboard, Intel Pentium IV Processor (Introduction)	(06)	
<b>Unit -3</b>	To interconnect the system with the video monitor, mouse, keyboard etc. and testing the operation of PC.	(04)	
<b>Unit -4</b>	To interconnect hard disk, and to connect Input / Output devices such as printers and TV tuner card and to install them.	(06)	
<b>Unit -5</b>	Study the bus system and various signal lines.	(04)	
<b>Unit -6</b>	Study of peripherals and their speed and capacity	(08)	
<b>Unit -7</b>	To install various operating systems such as Windows, Unix and Linux.	(12)	
<b>Unit -8</b>	To study the protection required for Windows and Linux Operating System.	(06)	
<b>Unit -9</b>	To study the various functions such as disk fragmentation and add/ remove hardware / software functions under Windows Operating System.	(06)	
<b>Unit -10</b>	To study the Burning process of CD under the latest version of any CD writing CD. Study exiting multi session disk etc.	(04)	
	<b>Total:-</b>	<b>(60)</b>	

### **Books Recommended:**

- |                                                                 |                                           |
|-----------------------------------------------------------------|-------------------------------------------|
| 1. IBM PC Technical Manual                                      | -                                         |
| 2. Computer maintenance and repair                              | - Schott Muller                           |
| 3. Computer Architecture                                        | - Raffiquzzaman                           |
| 4. Hardware and Software of PC, Willey Eastern Ltd., New Delhi. | - S. K. Bose                              |
| 5. Computer Installation and Trouble shooting, I.S.T.E.         | - M. Radhakrishnan and D. Balasubramaniam |

# Certificate

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Class: Diploma '5<sup>th</sup> sem'

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Exam No: CSE : 5<sup>th</sup> sem

Institution Patna Sahib Technical Campus, Bhagwanpur,  
Vaishali, Bihar.

*This is certified to be the bonafide work of the student in the  
SYSTEM MAINTENANCE LAB Laboratory during the academic  
year 2016/2019.*

No. of practicals certified \_\_\_\_\_ out of 10 in the  
subject of SYSTEM MAINTENANCE LAB.

.....  
Teacher In-charge

.....  
Examiner's Signature

.....  
Principal

Date: .....

Institution Rubber Stamp

(N.B: The candidate is expected to retain his/her journal till he/she passes in the subject.)

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Experiment - 01

AIM :- To identify various components, devices and section of PC.

APPARATUS REQUIRED :-

- i.) A Personal Computer
- ii.) Tool Box containing screw driver.

THEORY :-SYSTEM COMPONENTS :

A modern PC is both simple and complicated. It is simple in the sense that over the years, many of the components used to construct a system have become integrated with other components into fewer and fewer actual parts. It is complicated in the sense that each part in a modern system performs many more functions than did the same types of parts in older system.

\* Some of the basic components, and peripherals are as follows :-

- Motherboard
- Processor
- Memory (RAM)
- Case
- Power supply
- Floppy Disk

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- Hard disk
- CD-ROM, CD-RW or DVD-ROM drive
- Keyboard
- Mouse
- Video card
- Monitor
- Sound card
- Speaker & Modem

**Motherboard :** The motherboard is the core of the system. It really is the PC; everything else is connected to it, and controls everything in the system.

**Processor :** The Processor is often thought of as the "engine" of the computer. It is also called CPU.

**Memory (RAM) :** The system memory is often called RAM. This is primary memory, which holds all the programs and data the processor is using at a given time.

**Case :** The case is the frame or chassis that houses the motherboard, power supply, disk drives, adapter cards, and any other physical components in the system.

**Power supply:** The Power supply is what feeds electrical power to every single part in the PC.

**Floppy drive:** The Floppy drive is a simple, inexpensive, low-capacity, removable-media, magnetic storage device.

**Hard drive:** The Hard drive is the primary archival storage memory for the system.

**CD-ROM/DVD-ROM:** CD-ROM (compact Disk read only) and DVD-ROM (digital versatile disc read-only). drives are relatively high-capacity, removable media, optical drives.

**Keyboard:** The Keyboard is the primary device on a PC that is used by a human to communicate with and control a system.

**Mouse:** Although many types of pointing devices are on the market today, the first and most popular device for this purpose is the mouse.

video card: The video card controls the information we see on the monitor.

Monitor: The Monitor is the primary output device.

Sound card: It enables PC to generate complex sounds.

Modem: It is used for Internet connectivity.

### PROCEDURE :-

Step 1: Open system case using screw driver in the toolbox.

Step 2: We identified each part of the CPU by seeing it.

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AIM :- To Study motherboard,  
Intel Pentium IV Processor (Introduction).

### THEORY :-

**Motherboard :** A motherboard (sometimes alternatively known as the main circuit board, system board, base board, planer board, or logic board, or colloquially, a mobo) is the main printed circuit board (PCB) found in general purpose microcomputers and other expandable systems. It holds and allows communication between many of the central processing unit (CPU) and memory, and provides connectors for other peripherals.

Unlike a motherboard backplane, a motherboard usually contains the significant sub-systems such as the central processor; the chipset; input/output and memory controllers, interface connectors, and other components integrated for general purpose use and application.

It is mother to peripherals, interface cards, and daughter cards: sound cards, video cards, network cards, hard drives, or other forms of persistent storage.

## Intel Pentium IV Processor:

Pentium 4 is a brand by Intel for an entire series of single-core CPUs for desktops, laptops, and entry-level servers. The processors were shipped from November 20, 2000 until August 8, 2008.

All pentium 4 cpus are based on the NetBurst architecture.

The first pentium 4-branded processor to implement 64-bit was the prescott (90 nm) (February 2004), but this feature was not enabled.

Intel Processors Pentium IV have an integrated heat spreader (IHS) that prevent the die from accidentally being damaged when mounting and unmounting cooling solutions. Prior to the IHS, a CPU shield was sometimes used by people worried about damaging the core.

On November 20, 2000, Intel released the willamette-based pentium 4 clocked at 1.4 and 1.5 GHz. In January 2001, a still slower 1.3 GHz model was added to the range. In January 2002, Intel released Pentium 4s with a new core code named "Northwood" at speeds of 1.6 GHz, 1.8 GHz, 2 GHz and 2.2 GHz.

# Experiment - 03

AIM :- To interconnect the system with the video monitor, mouse, Keyboard etc. and testing the operation of PC.

Hardware Required :-

- i.) A computer system i.e- CPU
- ii.) Monitor
- iii.) Mouse
- iv.) Keyboard

PROCEDURE :-

Step 1 : Power ON the System i.e- CPU  
A system case contains SMPS, connecting power cable of SMPS with electricity board and by switching ON, the system starts.

Step 2 : Connecting Monitor

The monitor data cable will plug into the computer in only one place. Most monitor use either a DVI, VGA, or HDMI connector and plug into the corresponding port on the back of the computer.

If the monitor has only VGA plug and computer only has DVI connection, or vice versa, we need

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a Video converter to connect monitor.

Connect the monitor connector to the system monitor Port.

After the data cable has been connected to the computer, connect the power plug from the monitor to the surge protector.

Once a monitor is connected to the computer, Monitor starts displaying information about from the computer.

### Step 3: Connecting Keyboard

The Keyboard usually connect to the computer with the same type of connector, being either a PS/2 or USB connector. These connectors are either found closed to the top of where all connectors are located on the back of the computer.

Once a Keyboard connected, click windows key to open start menu.

### Step 4: Connecting mouse

The mouse usually connect to the computer with the same type of connector, being either a PS/2 or USB connector. These connectors are usually found closer to the top of where all the connectors are located on the back of the computer.

Once mouse is connected to the computer, A small arrow  will appear on the monitor.

### RESULT :-

System is connected with video monitor, keyboard and mouse and also tested.

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## Experiment - 04

AIM :- To interconnect hard disk, and to connect Input/output devices such as printers and TV tuner card and to install them.

### HARDWARE/APPARATUS REQUIRED :-

- i.) A computer system.
- ii.) Hard disk that matches the system
- iii.) A printer
- iv.) A TV tuner
- v.) Tool box

### PROCEDURE :-

Step 1 : Connecting Hard disk to computer system.

It includes a series of steps :-

- i.) Shut off and unplug the computer.
- ii.) Remove the case panel by using screwdriver or thumbscrews.
- iii.) Ground oneself. This will prevent electrostatic shock from damaging the components of computer.
- iv.) Remove the old drive.
  - Disconnect all the cables from both the motherboard and the power supply, unscrew all the screws on both sides of the hard drive, and then slide it out of the housing.

### v.) Insert new drive.

- Remove the drive from its packaging, then slide it into an open space in the hard drive housing.
- The drive should slide directly in, and the holes on the side of the drive should line up to the screw guides on the housing.

### vi.) Secure the hard drive.

Once the hard drive has been inserted, use the screws that came with it to secure the hard drive in the housing. Ideally we should use two screws on each side of the hard drive.

If the hard drive is loose, it can rattle and cause more noise and lead to physical damage.

- Tighten the screws to a firm tightness, but don't over-tighten as that may cause damage as well.

### vii.) Attach the drive to the motherboard.

- Newer hard drives will use SATA cables, which are thin and resemble USB cables. Use a SATA cable to connect the hard drive to the motherboard. SATA cables can be connected in either

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direction.

- If we are connecting our primary hard drive, the SATA cable should be plugged into the first SATA channel. This may be labelled on SATA0 or SATA1.

viii.) Connect the power supply to hard drive.

- Most newer power supplies have SATA power connectors, though older power supplies typically only have Molex connectors. If this is the case, and we are installing a SATA drive, we will need a Molex to SATA adapter.

- Ensure that none of the cables can come undone by wiggling them a little bit.

(ix.) Close up the computer.

Replace the case sides and reconnect the cables if we had to move the case to work on the inside.

x.) Plug back in and turn back on the computer.

We should hear the hard drive begin to spin up.

If we hear beeps or any jarring noise, immediately turn off computer and check connections.

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### Step 2: Connecting printer to computer.

- i.) Set up printer near the computer.
- ii.) Turn on the printer.
- iii.) With the computer turned ON and unlocked, plug the printer into the computer using a USB cable.
- iv.) Open Start .
- v.) Click Settings.
- vi.) Click Devices.
- vii.) Click Printers & scanners.
- viii.) Click Add a printer or scanner.
- ix.) Click the Printer's name and click Add device.
- x.) Follow the on-screen instructions.

### Step 3: Connecting TV-tuner.

- i.) Open up the box packing the TV tuner card, its remote and a few cables.
- ii.) Plug out the speaker jack from the second-card.
- iii.) Insert the cable that came along with the packaging in the place of the speaker jack into the sound card.
- iv.) The other end of the cable should be plugged into "the sound out" socket of the TV tuner card.

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- v.) The speaker jack should be plugged into the "sound-in" socket of the TV tuner card.
- vi.) Plug out the monitor display cable from the back of the CPU cabinet and plug in the TV tuner card.
- vii.) Now, take the other cable that had come bundled with the tuner card and plug one of its end of into the monitor socket on the CPU cabinet.
- viii.) Plug the other end of the cable into the "VGA-OUT" socket of the tuner card.
- ix.) Take the power adapter that came bundled with the card and plug it into a power source.
- x.) The output cable of the power adapter needs to be plugged into the 'power-In' socket of the tuner card.
- xi.) Insert the terrestrial antenna jack into the antenna socket of the card.
- xii.) Switch on the entire setup.
- xiii.) Use the remote control bundled with card and press power button.
- xiv.) Treat the setup like regular TV.

## Experiment - 05

AIM :- Study the bus system and various signal lines.

### THEORY:-

#### SYSTEM BUS :-

A system bus is a single computer bus that connects the major components of a computer system, combining the functions of a data bus to carry information, an address bus to determine where it should be present and a control bus to determine its operations. The technique was developed to reduce costs and improve modularity, and although popular in 1970's and 1980's, more modern computers use a variety of separate buses adapted to more specific needs.

To provide even more modularity with reduced cost, memory and I/O buses were sometimes combined into a single unified system bus.

Modularity and cost became important as computers became small enough to fit in single cabinet.

A CPU design evolved into using faster local buses and slower peripheral buses, Intel adopted DIB technology.

Using the external front-side bus to the main system memory, and the internal back-side bus between one or more CPUs and the CPU caches. These was introduced in the Pentium Pro and Pentium II products in the mid to late 1990s. The primary bus for communicating data between the CPU and main memory and input and output devices is called the front-side bus, and the back-side bus accesses the level 2 cache.

# Experiment - 06.

AIM :- To install various operating systems such as windows, UNIX and LINUX.

REQUIREMENT :- A PC

Windows Setup File

UNIX Setup File

LINUX Setup File.

PROCEDURE :-

[INSTALLING WINDOWS 7]

Step 1 : Enter Computer's BIOS.

Turn OFF the computer that we want to install windows on then turn it back on. When the BIOS screen appears or we are prompted to do so, press [Del], [ESC], [F2], [F10] or [F9] to enter the system BIOS. The key to enter the BIOS is usually shown on the screen.

Step 2 : Find BIOS's boot options menu.

The boot options menu of BIOS may vary in location or name from the illustration, but we may eventually find it if we search around.

Step 3: Select the CD-ROM drive as the first boot device of the computer.

Step 4: Save the changes of the settings.

Press the button indicated on the screen or select the save option from the BIOS menu to save the configuration.

Step 5: Shut off the computer.

Step 6: Power on the PC and the insert Windows 7 disc into CD/DVD drive.

Step 7: Start computer from the disc.

After we have placed the disc into the drive disc, start the computer. When the computer starts, press a key if we are asked if we would like to boot from the disc by pressing any key.

Step 8: Choose windows setup options.

Once windows setup loads, we'll be presented with a window. Select the preferred language, Keyboard type, and time/currency format, then click Next.

Step 9: Click the Install Now button.

Step 10: Accept the license terms.

Read over the Microsoft software License Terms, check I accept the license terms, and click Next.

Step 11: Select the custom installation.

Step 12: Decide on which hard drive and partition we want to install windows on.

- A hard drive is a physical part of the computer that stores data, and partitions "divide" hard disk drives into separate parts.

- If the hard disk drive has data on it, delete the data off of it, or format it.

- Select the hard drive from list of hard drives.

- Click drive options (advanced)

- Click Format from Drive Options.

Step 13: Install windows on the preferred hard disk drive and partitions. Once you've decided on where to install windows, select it and click Next. Window will begin installing.

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## [INSTALLING LINUX]

Step 14: Download the Linux distribution of the choice.

Step 15: Boot into Live CD or Live USB.

Step 16: Try out Linux distribution before installing.

Step 17: Start Installation Process.

Step 18: Create a username and password.

Step 19: Set up the partition.

Step 20: Boot into Linux.

Step 21: Check the hardware.

Step 22: Start using Linux.

### RESULT :-

Two operating systems "Windows 7" and "Any Linux distribution" is installed on the computer.

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## Experiment - 07.

AIM :- To study the various functions such as disk fragmentation and add/remove hardware/software functions under Windows Operating System.

REQUIREMENT :- Windows PC.

### THEORY :-

Defragmenting is commonly called defragging. No matter what we call it, defragging or defragmenting the hard drive will speed up disk performance.

If we haven't defragmented our PC's hard drive in a while (or ever), we're in for a treat. A freshly defragmented hard drive makes our computer seem brand new.

### PROCEDURE

[Defragmenting PC drive disk]

Step 1 : Open the Computer window.

Step 2 : Right-click the media we want to defragment, such as the main hard drive, C.

Step 3 : In the drive's properties dialog box, click the Tools tab.

Step 4: Click the Defragment Now button.

Step 5: Click the Analyze Disk button.

Step 6: Wait while windows checks the defragmentation on the media.

Step 7: Click the Defragment Disk button.

Step 8: Click the Close button, and close up any other windows we opened.

### [Installing a Program]

Step 9: Download or get the software from source.

Step 10: Double click to start setup and follow instruction to finish installation.

### [Uninstalling a Program]

Step 11: Click on start button to open Start menu.

Step 12: When the Start Menu Opens click on the Control Panel menu option.

Step 13: When control panel windows opens, click on the uninstall a program options option under the programs category.

Step 14: Click on the program, we want to uninstall from the computer. and Right click to get options.

Step 15: Click on uninstall option.

Step 16: Click Yes in the confirmation screen.

### RESULT :-

Disk drive C is defragmented, A program is installed and uninstalled.

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