

Computer Workshop Lab Manual

Unit I: Introduction and Computer Hardware

First Year Diploma in Computer Engineering
Government Polytechnic for Women, Sirsa

Unit I Overview

Unit I covers computer fundamentals, desktop and laptop hardware, motherboard, processor, buses, UPS, SMPS and safe handling of computer components. Students should perform every experiment under faculty supervision.

Experiment 1: Laboratory Safety and Computer Workshop Orientation

Aim

To study and perform the practical activity related to laboratory safety and computer workshop orientation.

Learning Outcomes

- Identify the components correctly.
- Explain the function of each component.
- Handle hardware safely.
- Follow standard laboratory procedures.

Theory

Introduce the concept in simple language. Explain the purpose, construction, working principle, applications and common faults. Include labelled photographs or diagrams while printing the final manual.

Apparatus Required

Desktop/Laptop, screwdriver set, antistatic wrist strap, hardware components, observation sheet.

Precautions

1. Switch OFF the power.
2. Remove power cable.
3. Wear an anti-static wrist strap.
4. Hold electronic components by their edges.
5. Keep screws safely.

Procedure

1. Observe the hardware.
2. Identify each part.
3. Record its name and function.
4. Perform the required activity.
5. Verify the observations with the instructor.

Observation Table

Use the table below to record observations.

Sr. No.	Component	Function	Remarks
1			
2			
3			

4			
5			

Result

The experiment was completed successfully and the required observations were recorded.

Viva Questions

- What is the purpose of this hardware/component?
- What precautions should be followed?
- What is BIOS?
- Differentiate hardware and software.
- What are the common faults?

Assignment

Draw neat labelled diagrams and write the function of each identified component.

Teacher's Remarks

Experiment 2: Identification of Desktop Computer Components

Aim

To study and perform the practical activity related to identification of desktop computer components.

Learning Outcomes

- Identify the components correctly.
- Explain the function of each component.
- Handle hardware safely.
- Follow standard laboratory procedures.

Theory

Introduce the concept in simple language. Explain the purpose, construction, working principle, applications and common faults. Include labelled photographs or diagrams while printing the final manual.

Apparatus Required

Desktop/Laptop, screwdriver set, antistatic wrist strap, hardware components, observation sheet.

Precautions

1. Switch OFF the power.
2. Remove power cable.
3. Wear an anti-static wrist strap.
4. Hold electronic components by their edges.
5. Keep screws safely.

Procedure

1. Observe the hardware.
2. Identify each part.
3. Record its name and function.
4. Perform the required activity.
5. Verify the observations with the instructor.

Observation Table

Use the table below to record observations.

Sr. No.	Component	Function	Remarks
1			
2			
3			
4			
5			

Result

The experiment was completed successfully and the required observations were recorded.

Viva Questions

- What is the purpose of this hardware/component?
- What precautions should be followed?
- What is BIOS?
- Differentiate hardware and software.
- What are the common faults?

Assignment

Draw neat labelled diagrams and write the function of each identified component.

Teacher's Remarks

Experiment 3: Study of Computer Hardware, Software and Firmware

Aim

To study and perform the practical activity related to study of computer hardware, software and firmware.

Learning Outcomes

- Identify the components correctly.
- Explain the function of each component.
- Handle hardware safely.
- Follow standard laboratory procedures.

Theory

Introduce the concept in simple language. Explain the purpose, construction, working principle, applications and common faults. Include labelled photographs or diagrams while printing the final manual.

Apparatus Required

Desktop/Laptop, screwdriver set, antistatic wrist strap, hardware components, observation sheet.

Precautions

1. Switch OFF the power.
2. Remove power cable.
3. Wear an anti-static wrist strap.
4. Hold electronic components by their edges.
5. Keep screws safely.

Procedure

1. Observe the hardware.
2. Identify each part.
3. Record its name and function.
4. Perform the required activity.
5. Verify the observations with the instructor.

Observation Table

Use the table below to record observations.

Sr. No.	Component	Function	Remarks
1			
2			
3			

4			
5			

Result

The experiment was completed successfully and the required observations were recorded.

Viva Questions

- What is the purpose of this hardware/component?
- What precautions should be followed?
- What is BIOS?
- Differentiate hardware and software.
- What are the common faults?

Assignment

Draw neat labelled diagrams and write the function of each identified component.

Teacher's Remarks

Experiment 4: Study of Motherboard Components and Connectors

Aim

To study and perform the practical activity related to study of motherboard components and connectors.

Learning Outcomes

- Identify the components correctly.
- Explain the function of each component.
- Handle hardware safely.
- Follow standard laboratory procedures.

Theory

Introduce the concept in simple language. Explain the purpose, construction, working principle, applications and common faults. Include labelled photographs or diagrams while printing the final manual.

Apparatus Required

Desktop/Laptop, screwdriver set, antistatic wrist strap, hardware components, observation sheet.

Precautions

1. Switch OFF the power.
2. Remove power cable.
3. Wear an anti-static wrist strap.
4. Hold electronic components by their edges.
5. Keep screws safely.

Procedure

1. Observe the hardware.
2. Identify each part.
3. Record its name and function.
4. Perform the required activity.
5. Verify the observations with the instructor.

Observation Table

Use the table below to record observations.

Sr. No.	Component	Function	Remarks
1			
2			
3			
4			
5			

Result

The experiment was completed successfully and the required observations were recorded.

Viva Questions

- What is the purpose of this hardware/component?
- What precautions should be followed?
- What is BIOS?
- Differentiate hardware and software.
- What are the common faults?

Assignment

Draw neat labelled diagrams and write the function of each identified component.

Teacher's Remarks

Experiment 5: Identification of I/O Ports and Expansion Slots

Aim

To study and perform the practical activity related to identification of i/o ports and expansion slots.

Learning Outcomes

- Identify the components correctly.
- Explain the function of each component.
- Handle hardware safely.
- Follow standard laboratory procedures.

Theory

Introduce the concept in simple language. Explain the purpose, construction, working principle, applications and common faults. Include labelled photographs or diagrams while printing the final manual.

Apparatus Required

Desktop/Laptop, screwdriver set, antistatic wrist strap, hardware components, observation sheet.

Precautions

1. Switch OFF the power.
2. Remove power cable.
3. Wear an anti-static wrist strap.
4. Hold electronic components by their edges.
5. Keep screws safely.

Procedure

1. Observe the hardware.
2. Identify each part.
3. Record its name and function.
4. Perform the required activity.
5. Verify the observations with the instructor.

Observation Table

Use the table below to record observations.

Sr. No.	Component	Function	Remarks
1			
2			
3			
4			
5			

Result

The experiment was completed successfully and the required observations were recorded.

Viva Questions

- What is the purpose of this hardware/component?
- What precautions should be followed?
- What is BIOS?
- Differentiate hardware and software.
- What are the common faults?

Assignment

Draw neat labelled diagrams and write the function of each identified component.

Teacher's Remarks

Experiment 6: Study of CPU (Processor) and Heat Sink

Aim

To study and perform the practical activity related to study of cpu (processor) and heat sink.

Learning Outcomes

- Identify the components correctly.
- Explain the function of each component.
- Handle hardware safely.
- Follow standard laboratory procedures.

Theory

Introduce the concept in simple language. Explain the purpose, construction, working principle, applications and common faults. Include labelled photographs or diagrams while printing the final manual.

Apparatus Required

Desktop/Laptop, screwdriver set, antistatic wrist strap, hardware components, observation sheet.

Precautions

1. Switch OFF the power.
2. Remove power cable.
3. Wear an anti-static wrist strap.
4. Hold electronic components by their edges.
5. Keep screws safely.

Procedure

1. Observe the hardware.
2. Identify each part.
3. Record its name and function.
4. Perform the required activity.
5. Verify the observations with the instructor.

Observation Table

Use the table below to record observations.

Sr. No.	Component	Function	Remarks
1			
2			
3			
4			
5			

Result

The experiment was completed successfully and the required observations were recorded.

Viva Questions

- What is the purpose of this hardware/component?
- What precautions should be followed?
- What is BIOS?
- Differentiate hardware and software.
- What are the common faults?

Assignment

Draw neat labelled diagrams and write the function of each identified component.

Teacher's Remarks

Experiment 7: Study of Different Types of Processors

Aim

To study and perform the practical activity related to study of different types of processors.

Learning Outcomes

- Identify the components correctly.
- Explain the function of each component.
- Handle hardware safely.
- Follow standard laboratory procedures.

Theory

Introduce the concept in simple language. Explain the purpose, construction, working principle, applications and common faults. Include labelled photographs or diagrams while printing the final manual.

Apparatus Required

Desktop/Laptop, screwdriver set, antistatic wrist strap, hardware components, observation sheet.

Precautions

1. Switch OFF the power.
2. Remove power cable.
3. Wear an anti-static wrist strap.
4. Hold electronic components by their edges.
5. Keep screws safely.

Procedure

1. Observe the hardware.
2. Identify each part.
3. Record its name and function.
4. Perform the required activity.
5. Verify the observations with the instructor.

Observation Table

Use the table below to record observations.

Sr. No.	Component	Function	Remarks
1			
2			
3			
4			
5			

Result

The experiment was completed successfully and the required observations were recorded.

Viva Questions

- What is the purpose of this hardware/component?
- What precautions should be followed?
- What is BIOS?
- Differentiate hardware and software.
- What are the common faults?

Assignment

Draw neat labelled diagrams and write the function of each identified component.

Teacher's Remarks

Experiment 8: Identification of RAM Modules and Memory Slots

Aim

To study and perform the practical activity related to identification of ram modules and memory slots.

Learning Outcomes

- Identify the components correctly.
- Explain the function of each component.
- Handle hardware safely.
- Follow standard laboratory procedures.

Theory

Introduce the concept in simple language. Explain the purpose, construction, working principle, applications and common faults. Include labelled photographs or diagrams while printing the final manual.

Apparatus Required

Desktop/Laptop, screwdriver set, antistatic wrist strap, hardware components, observation sheet.

Precautions

1. Switch OFF the power.
2. Remove power cable.
3. Wear an anti-static wrist strap.
4. Hold electronic components by their edges.
5. Keep screws safely.

Procedure

1. Observe the hardware.
2. Identify each part.
3. Record its name and function.
4. Perform the required activity.
5. Verify the observations with the instructor.

Observation Table

Use the table below to record observations.

Sr. No.	Component	Function	Remarks
1			
2			
3			
4			
5			

Result

The experiment was completed successfully and the required observations were recorded.

Viva Questions

- What is the purpose of this hardware/component?
- What precautions should be followed?
- What is BIOS?
- Differentiate hardware and software.
- What are the common faults?

Assignment

Draw neat labelled diagrams and write the function of each identified component.

Teacher's Remarks

Experiment 9: Study of System Bus Architecture

Aim

To study and perform the practical activity related to study of system bus architecture.

Learning Outcomes

- Identify the components correctly.
- Explain the function of each component.
- Handle hardware safely.
- Follow standard laboratory procedures.

Theory

Introduce the concept in simple language. Explain the purpose, construction, working principle, applications and common faults. Include labelled photographs or diagrams while printing the final manual.

Apparatus Required

Desktop/Laptop, screwdriver set, antistatic wrist strap, hardware components, observation sheet.

Precautions

1. Switch OFF the power.
2. Remove power cable.
3. Wear an anti-static wrist strap.
4. Hold electronic components by their edges.
5. Keep screws safely.

Procedure

1. Observe the hardware.
2. Identify each part.
3. Record its name and function.
4. Perform the required activity.
5. Verify the observations with the instructor.

Observation Table

Use the table below to record observations.

Sr. No.	Component	Function	Remarks
1			
2			
3			
4			
5			

Result

The experiment was completed successfully and the required observations were recorded.

Viva Questions

- What is the purpose of this hardware/component?
- What precautions should be followed?
- What is BIOS?
- Differentiate hardware and software.
- What are the common faults?

Assignment

Draw neat labelled diagrams and write the function of each identified component.

Teacher's Remarks

Experiment 10: Identification of Laptop Components

Aim

To study and perform the practical activity related to identification of laptop components.

Learning Outcomes

- Identify the components correctly.
- Explain the function of each component.
- Handle hardware safely.
- Follow standard laboratory procedures.

Theory

Introduce the concept in simple language. Explain the purpose, construction, working principle, applications and common faults. Include labelled photographs or diagrams while printing the final manual.

Apparatus Required

Desktop/Laptop, screwdriver set, antistatic wrist strap, hardware components, observation sheet.

Precautions

1. Switch OFF the power.
2. Remove power cable.
3. Wear an anti-static wrist strap.
4. Hold electronic components by their edges.
5. Keep screws safely.

Procedure

1. Observe the hardware.
2. Identify each part.
3. Record its name and function.
4. Perform the required activity.
5. Verify the observations with the instructor.

Observation Table

Use the table below to record observations.

Sr. No.	Component	Function	Remarks
1			
2			
3			
4			
5			

Result

The experiment was completed successfully and the required observations were recorded.

Viva Questions

- What is the purpose of this hardware/component?
- What precautions should be followed?
- What is BIOS?
- Differentiate hardware and software.
- What are the common faults?

Assignment

Draw neat labelled diagrams and write the function of each identified component.

Teacher's Remarks

Experiment 11: Study of Laptop Adapter, Battery and Charging Circuit

Aim

To study and perform the practical activity related to study of laptop adapter, battery and charging circuit.

Learning Outcomes

- Identify the components correctly.
- Explain the function of each component.
- Handle hardware safely.
- Follow standard laboratory procedures.

Theory

Introduce the concept in simple language. Explain the purpose, construction, working principle, applications and common faults. Include labelled photographs or diagrams while printing the final manual.

Apparatus Required

Desktop/Laptop, screwdriver set, antistatic wrist strap, hardware components, observation sheet.

Precautions

1. Switch OFF the power.
2. Remove power cable.
3. Wear an anti-static wrist strap.
4. Hold electronic components by their edges.
5. Keep screws safely.

Procedure

1. Observe the hardware.
2. Identify each part.
3. Record its name and function.
4. Perform the required activity.
5. Verify the observations with the instructor.

Observation Table

Use the table below to record observations.

Sr. No.	Component	Function	Remarks
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2			
3			

4			
5			

Result

The experiment was completed successfully and the required observations were recorded.

Viva Questions

- What is the purpose of this hardware/component?
- What precautions should be followed?
- What is BIOS?
- Differentiate hardware and software.
- What are the common faults?

Assignment

Draw neat labelled diagrams and write the function of each identified component.

Teacher's Remarks

Experiment 12: Study of Laptop Keyboard and Touchpad

Aim

To study and perform the practical activity related to study of laptop keyboard and touchpad.

Learning Outcomes

- Identify the components correctly.
- Explain the function of each component.
- Handle hardware safely.
- Follow standard laboratory procedures.

Theory

Introduce the concept in simple language. Explain the purpose, construction, working principle, applications and common faults. Include labelled photographs or diagrams while printing the final manual.

Apparatus Required

Desktop/Laptop, screwdriver set, antistatic wrist strap, hardware components, observation sheet.

Precautions

1. Switch OFF the power.
2. Remove power cable.
3. Wear an anti-static wrist strap.
4. Hold electronic components by their edges.
5. Keep screws safely.

Procedure

1. Observe the hardware.
2. Identify each part.
3. Record its name and function.
4. Perform the required activity.
5. Verify the observations with the instructor.

Observation Table

Use the table below to record observations.

Sr. No.	Component	Function	Remarks
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3			
4			
5			

Result

The experiment was completed successfully and the required observations were recorded.

Viva Questions

- What is the purpose of this hardware/component?
- What precautions should be followed?
- What is BIOS?
- Differentiate hardware and software.
- What are the common faults?

Assignment

Draw neat labelled diagrams and write the function of each identified component.

Teacher's Remarks

Experiment 13: Study of Online and Offline UPS

Aim

To study and perform the practical activity related to study of online and offline ups.

Learning Outcomes

- Identify the components correctly.
- Explain the function of each component.
- Handle hardware safely.
- Follow standard laboratory procedures.

Theory

Introduce the concept in simple language. Explain the purpose, construction, working principle, applications and common faults. Include labelled photographs or diagrams while printing the final manual.

Apparatus Required

Desktop/Laptop, screwdriver set, antistatic wrist strap, hardware components, observation sheet.

Precautions

1. Switch OFF the power.
2. Remove power cable.
3. Wear an anti-static wrist strap.
4. Hold electronic components by their edges.
5. Keep screws safely.

Procedure

1. Observe the hardware.
2. Identify each part.
3. Record its name and function.
4. Perform the required activity.
5. Verify the observations with the instructor.

Observation Table

Use the table below to record observations.

Sr. No.	Component	Function	Remarks
1			
2			
3			
4			
5			

Result

The experiment was completed successfully and the required observations were recorded.

Viva Questions

- What is the purpose of this hardware/component?
- What precautions should be followed?
- What is BIOS?
- Differentiate hardware and software.
- What are the common faults?

Assignment

Draw neat labelled diagrams and write the function of each identified component.

Teacher's Remarks

Experiment 14: Study of SMPS and Power Connectors

Aim

To study and perform the practical activity related to study of smps and power connectors.

Learning Outcomes

- Identify the components correctly.
- Explain the function of each component.
- Handle hardware safely.
- Follow standard laboratory procedures.

Theory

Introduce the concept in simple language. Explain the purpose, construction, working principle, applications and common faults. Include labelled photographs or diagrams while printing the final manual.

Apparatus Required

Desktop/Laptop, screwdriver set, antistatic wrist strap, hardware components, observation sheet.

Precautions

1. Switch OFF the power.
2. Remove power cable.
3. Wear an anti-static wrist strap.
4. Hold electronic components by their edges.
5. Keep screws safely.

Procedure

1. Observe the hardware.
2. Identify each part.
3. Record its name and function.
4. Perform the required activity.
5. Verify the observations with the instructor.

Observation Table

Use the table below to record observations.

Sr. No.	Component	Function	Remarks
1			
2			
3			
4			
5			

Result

The experiment was completed successfully and the required observations were recorded.

Viva Questions

- What is the purpose of this hardware/component?
- What precautions should be followed?
- What is BIOS?
- Differentiate hardware and software.
- What are the common faults?

Assignment

Draw neat labelled diagrams and write the function of each identified component.

Teacher's Remarks

Experiment 15: Opening and Reassembling a Desktop CPU Cabinet

Aim

To study and perform the practical activity related to opening and reassembling a desktop cpu cabinet.

Learning Outcomes

- Identify the components correctly.
- Explain the function of each component.
- Handle hardware safely.
- Follow standard laboratory procedures.

Theory

Introduce the concept in simple language. Explain the purpose, construction, working principle, applications and common faults. Include labelled photographs or diagrams while printing the final manual.

Apparatus Required

Desktop/Laptop, screwdriver set, antistatic wrist strap, hardware components, observation sheet.

Precautions

1. Switch OFF the power.
2. Remove power cable.
3. Wear an anti-static wrist strap.
4. Hold electronic components by their edges.
5. Keep screws safely.

Procedure

1. Observe the hardware.
2. Identify each part.
3. Record its name and function.
4. Perform the required activity.
5. Verify the observations with the instructor.

Observation Table

Use the table below to record observations.

Sr. No.	Component	Function	Remarks
1			
2			
3			
4			
5			

Result

The experiment was completed successfully and the required observations were recorded.

Viva Questions

- What is the purpose of this hardware/component?
- What precautions should be followed?
- What is BIOS?
- Differentiate hardware and software.
- What are the common faults?

Assignment

Draw neat labelled diagrams and write the function of each identified component.

Teacher's Remarks

Computer Workshop Lab Manual

Unit II: Memory and Storage Devices

Unit II Overview

This unit covers primary memory, secondary storage devices, optical storage, flash memory, hard disk partitioning and formatting, and identification of modern storage devices.

Experiment 1: Identification of Primary Memory (SDRAM, DDR, DDR2, DDR3, DDR4 and DDR5)

Aim

To perform practical work on identification of primary memory (sdram, ddr, ddr2, ddr3, ddr4 and ddr5).

Learning Outcomes

- Identify different memory/storage devices.
- Compare specifications and applications.
- Install and test devices safely.
- Record practical observations.

Theory

Explain the construction, working principle, specifications, advantages, limitations and applications of the device(s). Add labelled photographs and screenshots in the final illustrated edition.

Apparatus Required

Desktop computer, RAM modules, HDD, SSD, SATA cable, IDE cable (if available), optical drive, pen drive, memory cards, screwdriver kit.

Precautions

1. Turn off power before opening the cabinet.
2. Ground yourself to avoid static electricity.
3. Handle storage devices carefully.
4. Never force connectors into ports.

Procedure

1. Observe the device.
2. Identify its type and specifications.
3. Install or connect the device.
4. Verify detection in BIOS/Operating System.
5. Record observations.

Observation Table

Sr.	Device	Specification	Status	Remarks
1				
2				
3				
4				
5				

Result

The storage device was successfully identified/installed and verified.

Viva Questions

- Differentiate RAM and ROM.
- What is the difference between HDD and SSD?
- Why is partitioning required?
- What is SATA?
- What is the purpose of formatting?

Assignment

Prepare a comparison chart of different storage devices including capacity, speed, interface and applications.

Teacher's Remarks

Experiment 2: Study of RAM Installation and Removal

Aim

To perform practical work on study of ram installation and removal.

Learning Outcomes

- Identify different memory/storage devices.
- Compare specifications and applications.
- Install and test devices safely.
- Record practical observations.

Theory

Explain the construction, working principle, specifications, advantages, limitations and applications of the device(s). Add labelled photographs and screenshots in the final illustrated edition.

Apparatus Required

Desktop computer, RAM modules, HDD, SSD, SATA cable, IDE cable (if available), optical drive, pen drive, memory cards, screwdriver kit.

Precautions

1. Turn off power before opening the cabinet.
2. Ground yourself to avoid static electricity.
3. Handle storage devices carefully.
4. Never force connectors into ports.

Procedure

1. Observe the device.
2. Identify its type and specifications.
3. Install or connect the device.
4. Verify detection in BIOS/Operating System.
5. Record observations.

Observation Table

Sr.	Device	Specification	Status	Remarks
1				
2				
3				
4				
5				

Result

The storage device was successfully identified/installed and verified.

Viva Questions

- Differentiate RAM and ROM.
- What is the difference between HDD and SSD?
- Why is partitioning required?
- What is SATA?
- What is the purpose of formatting?

Assignment

Prepare a comparison chart of different storage devices including capacity, speed, interface and applications.

Teacher's Remarks

Experiment 3: Identification of Hard Disk Drives (IDE, SATA and SSD)

Aim

To perform practical work on identification of hard disk drives (ide, sata and ssd).

Learning Outcomes

- Identify different memory/storage devices.
- Compare specifications and applications.
- Install and test devices safely.
- Record practical observations.

Theory

Explain the construction, working principle, specifications, advantages, limitations and applications of the device(s). Add labelled photographs and screenshots in the final illustrated edition.

Apparatus Required

Desktop computer, RAM modules, HDD, SSD, SATA cable, IDE cable (if available), optical drive, pen drive, memory cards, screwdriver kit.

Precautions

1. Turn off power before opening the cabinet.
2. Ground yourself to avoid static electricity.
3. Handle storage devices carefully.
4. Never force connectors into ports.

Procedure

1. Observe the device.
2. Identify its type and specifications.
3. Install or connect the device.
4. Verify detection in BIOS/Operating System.
5. Record observations.

Observation Table

Sr.	Device	Specification	Status	Remarks
1				
2				
3				
4				
5				

Result

The storage device was successfully identified/installed and verified.

Viva Questions

- Differentiate RAM and ROM.
- What is the difference between HDD and SSD?
- Why is partitioning required?
- What is SATA?
- What is the purpose of formatting?

Assignment

Prepare a comparison chart of different storage devices including capacity, speed, interface and applications.

Teacher's Remarks

Experiment 4: Study of Hard Disk Partitioning and Formatting

Aim

To perform practical work on study of hard disk partitioning and formatting.

Learning Outcomes

- Identify different memory/storage devices.
- Compare specifications and applications.
- Install and test devices safely.
- Record practical observations.

Theory

Explain the construction, working principle, specifications, advantages, limitations and applications of the device(s). Add labelled photographs and screenshots in the final illustrated edition.

Apparatus Required

Desktop computer, RAM modules, HDD, SSD, SATA cable, IDE cable (if available), optical drive, pen drive, memory cards, screwdriver kit.

Precautions

1. Turn off power before opening the cabinet.
2. Ground yourself to avoid static electricity.
3. Handle storage devices carefully.
4. Never force connectors into ports.

Procedure

1. Observe the device.
2. Identify its type and specifications.
3. Install or connect the device.
4. Verify detection in BIOS/Operating System.
5. Record observations.

Observation Table

Sr.	Device	Specification	Status	Remarks
1				
2				
3				
4				
5				

Result

The storage device was successfully identified/installed and verified.

Viva Questions

- Differentiate RAM and ROM.
- What is the difference between HDD and SSD?
- Why is partitioning required?
- What is SATA?
- What is the purpose of formatting?

Assignment

Prepare a comparison chart of different storage devices including capacity, speed, interface and applications.

Teacher's Remarks

Experiment 5: Study of Optical Storage Devices (CD, DVD and Blu-ray)

Aim

To perform practical work on study of optical storage devices (cd, dvd and blu-ray).

Learning Outcomes

- Identify different memory/storage devices.
- Compare specifications and applications.
- Install and test devices safely.
- Record practical observations.

Theory

Explain the construction, working principle, specifications, advantages, limitations and applications of the device(s). Add labelled photographs and screenshots in the final illustrated edition.

Apparatus Required

Desktop computer, RAM modules, HDD, SSD, SATA cable, IDE cable (if available), optical drive, pen drive, memory cards, screwdriver kit.

Precautions

1. Turn off power before opening the cabinet.
2. Ground yourself to avoid static electricity.
3. Handle storage devices carefully.
4. Never force connectors into ports.

Procedure

1. Observe the device.
2. Identify its type and specifications.
3. Install or connect the device.
4. Verify detection in BIOS/Operating System.
5. Record observations.

Observation Table

Sr.	Device	Specification	Status	Remarks
1				
2				
3				
4				
5				

Result

The storage device was successfully identified/installed and verified.

Viva Questions

- Differentiate RAM and ROM.
- What is the difference between HDD and SSD?
- Why is partitioning required?
- What is SATA?
- What is the purpose of formatting?

Assignment

Prepare a comparison chart of different storage devices including capacity, speed, interface and applications.

Teacher's Remarks

Experiment 6: Identification of Flash Storage Devices (Pen Drive and Memory Cards)

Aim

To perform practical work on identification of flash storage devices (pen drive and memory cards).

Learning Outcomes

- Identify different memory/storage devices.
- Compare specifications and applications.
- Install and test devices safely.
- Record practical observations.

Theory

Explain the construction, working principle, specifications, advantages, limitations and applications of the device(s). Add labelled photographs and screenshots in the final illustrated edition.

Apparatus Required

Desktop computer, RAM modules, HDD, SSD, SATA cable, IDE cable (if available), optical drive, pen drive, memory cards, screwdriver kit.

Precautions

1. Turn off power before opening the cabinet.
2. Ground yourself to avoid static electricity.
3. Handle storage devices carefully.
4. Never force connectors into ports.

Procedure

1. Observe the device.
2. Identify its type and specifications.
3. Install or connect the device.
4. Verify detection in BIOS/Operating System.
5. Record observations.

Observation Table

Sr.	Device	Specification	Status	Remarks
1				
2				
3				
4				
5				

Result

The storage device was successfully identified/installed and verified.

Viva Questions

- Differentiate RAM and ROM.
- What is the difference between HDD and SSD?
- Why is partitioning required?
- What is SATA?
- What is the purpose of formatting?

Assignment

Prepare a comparison chart of different storage devices including capacity, speed, interface and applications.

Teacher's Remarks

Experiment 7: Comparison of Storage Devices Based on Capacity, Speed and Cost

Aim

To perform practical work on comparison of storage devices based on capacity, speed and cost.

Learning Outcomes

- Identify different memory/storage devices.
- Compare specifications and applications.
- Install and test devices safely.
- Record practical observations.

Theory

Explain the construction, working principle, specifications, advantages, limitations and applications of the device(s). Add labelled photographs and screenshots in the final illustrated edition.

Apparatus Required

Desktop computer, RAM modules, HDD, SSD, SATA cable, IDE cable (if available), optical drive, pen drive, memory cards, screwdriver kit.

Precautions

1. Turn off power before opening the cabinet.
2. Ground yourself to avoid static electricity.
3. Handle storage devices carefully.
4. Never force connectors into ports.

Procedure

1. Observe the device.
2. Identify its type and specifications.
3. Install or connect the device.
4. Verify detection in BIOS/Operating System.
5. Record observations.

Observation Table

Sr.	Device	Specification	Status	Remarks
1				
2				
3				
4				
5				

Result

The storage device was successfully identified/installed and verified.

Viva Questions

- Differentiate RAM and ROM.
- What is the difference between HDD and SSD?
- Why is partitioning required?
- What is SATA?
- What is the purpose of formatting?

Assignment

Prepare a comparison chart of different storage devices including capacity, speed, interface and applications.

Teacher's Remarks

Experiment 8: Practical on Installation and Testing of Storage Devices

Aim

To perform practical work on practical on installation and testing of storage devices.

Learning Outcomes

- Identify different memory/storage devices.
- Compare specifications and applications.
- Install and test devices safely.
- Record practical observations.

Theory

Explain the construction, working principle, specifications, advantages, limitations and applications of the device(s). Add labelled photographs and screenshots in the final illustrated edition.

Apparatus Required

Desktop computer, RAM modules, HDD, SSD, SATA cable, IDE cable (if available), optical drive, pen drive, memory cards, screwdriver kit.

Precautions

1. Turn off power before opening the cabinet.
2. Ground yourself to avoid static electricity.
3. Handle storage devices carefully.
4. Never force connectors into ports.

Procedure

1. Observe the device.
2. Identify its type and specifications.
3. Install or connect the device.
4. Verify detection in BIOS/Operating System.
5. Record observations.

Observation Table

Sr.	Device	Specification	Status	Remarks
1				
2				
3				
4				
5				

Result

The storage device was successfully identified/installed and verified.

Viva Questions

- Differentiate RAM and ROM.
- What is the difference between HDD and SSD?
- Why is partitioning required?
- What is SATA?
- What is the purpose of formatting?

Assignment

Prepare a comparison chart of different storage devices including capacity, speed, interface and applications.

Teacher's Remarks

Computer Workshop Lab Manual

Unit III: I/O Devices and Interfacing

Unit III Overview

This unit covers input and output devices, interfaces, ports, display devices, printers, graphics cards, and troubleshooting of common peripherals.

Experiment 1: Study of Wired and Wireless Keyboards

Aim

To study and perform practical work on study of wired and wireless keyboards.

Learning Outcomes

- Identify devices.
- Connect and configure correctly.
- Troubleshoot common faults.
- Follow safe laboratory practices.

Theory

Describe the working principle, types, specifications, applications, advantages and limitations of the device. Add labelled photographs and screenshots in the illustrated edition.

Apparatus Required

Desktop/Laptop, keyboard, mouse, monitor, printer, graphics card, cables, drivers and toolkit.

Precautions

1. Switch off equipment before connecting cables.
2. Avoid excessive force on ports.
3. Use correct drivers.
4. Keep connectors clean.

Procedure

1. Identify the device.
2. Connect it correctly.
3. Install drivers if required.
4. Test functionality.
5. Record observations.

Observation Table

Sr.	Device	Interface	Status	Remarks
1				
2				
3				
4				
5				

Result

The device was connected, tested and verified successfully.

Viva Questions

- Differentiate USB 2.0 and USB 3.0.

- What is HDMI used for?
- What are common printer faults?
- Differentiate LCD and LED displays.
- What is the purpose of a graphics card?

Assignment

Prepare a comparison table of related devices with interfaces, advantages and applications.

Teacher's Remarks

Experiment 2: Keyboard Connectors and Troubleshooting

Aim

To study and perform practical work on keyboard connectors and troubleshooting.

Learning Outcomes

- Identify devices.
- Connect and configure correctly.
- Troubleshoot common faults.
- Follow safe laboratory practices.

Theory

Describe the working principle, types, specifications, applications, advantages and limitations of the device. Add labelled photographs and screenshots in the illustrated edition.

Apparatus Required

Desktop/Laptop, keyboard, mouse, monitor, printer, graphics card, cables, drivers and toolkit.

Precautions

1. Switch off equipment before connecting cables.
2. Avoid excessive force on ports.
3. Use correct drivers.
4. Keep connectors clean.

Procedure

1. Identify the device.
2. Connect it correctly.
3. Install drivers if required.
4. Test functionality.
5. Record observations.

Observation Table

Sr.	Device	Interface	Status	Remarks
1				
2				
3				
4				
5				

Result

The device was connected, tested and verified successfully.

Viva Questions

- Differentiate USB 2.0 and USB 3.0.

- What is HDMI used for?
- What are common printer faults?
- Differentiate LCD and LED displays.
- What is the purpose of a graphics card?

Assignment

Prepare a comparison table of related devices with interfaces, advantages and applications.

Teacher's Remarks

Experiment 3: Study of Optical and Wireless Mouse

Aim

To study and perform practical work on study of optical and wireless mouse.

Learning Outcomes

- Identify devices.
- Connect and configure correctly.
- Troubleshoot common faults.
- Follow safe laboratory practices.

Theory

Describe the working principle, types, specifications, applications, advantages and limitations of the device. Add labelled photographs and screenshots in the illustrated edition.

Apparatus Required

Desktop/Laptop, keyboard, mouse, monitor, printer, graphics card, cables, drivers and toolkit.

Precautions

1. Switch off equipment before connecting cables.
2. Avoid excessive force on ports.
3. Use correct drivers.
4. Keep connectors clean.

Procedure

1. Identify the device.
2. Connect it correctly.
3. Install drivers if required.
4. Test functionality.
5. Record observations.

Observation Table

Sr.	Device	Interface	Status	Remarks
1				
2				
3				
4				
5				

Result

The device was connected, tested and verified successfully.

Viva Questions

- Differentiate USB 2.0 and USB 3.0.

- What is HDMI used for?
- What are common printer faults?
- Differentiate LCD and LED displays.
- What is the purpose of a graphics card?

Assignment

Prepare a comparison table of related devices with interfaces, advantages and applications.

Teacher's Remarks

Experiment 4: Mouse Connectors and Troubleshooting

Aim

To study and perform practical work on mouse connectors and troubleshooting.

Learning Outcomes

- Identify devices.
- Connect and configure correctly.
- Troubleshoot common faults.
- Follow safe laboratory practices.

Theory

Describe the working principle, types, specifications, applications, advantages and limitations of the device. Add labelled photographs and screenshots in the illustrated edition.

Apparatus Required

Desktop/Laptop, keyboard, mouse, monitor, printer, graphics card, cables, drivers and toolkit.

Precautions

1. Switch off equipment before connecting cables.
2. Avoid excessive force on ports.
3. Use correct drivers.
4. Keep connectors clean.

Procedure

1. Identify the device.
2. Connect it correctly.
3. Install drivers if required.
4. Test functionality.
5. Record observations.

Observation Table

Sr.	Device	Interface	Status	Remarks
1				
2				
3				
4				
5				

Result

The device was connected, tested and verified successfully.

Viva Questions

- Differentiate USB 2.0 and USB 3.0.

- What is HDMI used for?
- What are common printer faults?
- Differentiate LCD and LED displays.
- What is the purpose of a graphics card?

Assignment

Prepare a comparison table of related devices with interfaces, advantages and applications.

Teacher's Remarks

Experiment 5: Identification of Serial, Parallel, USB and HDMI Ports

Aim

To study and perform practical work on identification of serial, parallel, usb and hdmi ports.

Learning Outcomes

- Identify devices.
- Connect and configure correctly.
- Troubleshoot common faults.
- Follow safe laboratory practices.

Theory

Describe the working principle, types, specifications, applications, advantages and limitations of the device. Add labelled photographs and screenshots in the illustrated edition.

Apparatus Required

Desktop/Laptop, keyboard, mouse, monitor, printer, graphics card, cables, drivers and toolkit.

Precautions

1. Switch off equipment before connecting cables.
2. Avoid excessive force on ports.
3. Use correct drivers.
4. Keep connectors clean.

Procedure

1. Identify the device.
2. Connect it correctly.
3. Install drivers if required.
4. Test functionality.
5. Record observations.

Observation Table

Sr.	Device	Interface	Status	Remarks
1				
2				
3				
4				
5				

Result

The device was connected, tested and verified successfully.

Viva Questions

- Differentiate USB 2.0 and USB 3.0.

- What is HDMI used for?
- What are common printer faults?
- Differentiate LCD and LED displays.
- What is the purpose of a graphics card?

Assignment

Prepare a comparison table of related devices with interfaces, advantages and applications.

Teacher's Remarks

Experiment 6: Study of LCD, LED and TFT Displays

Aim

To study and perform practical work on study of lcd, led and tft displays.

Learning Outcomes

- Identify devices.
- Connect and configure correctly.
- Troubleshoot common faults.
- Follow safe laboratory practices.

Theory

Describe the working principle, types, specifications, applications, advantages and limitations of the device. Add labelled photographs and screenshots in the illustrated edition.

Apparatus Required

Desktop/Laptop, keyboard, mouse, monitor, printer, graphics card, cables, drivers and toolkit.

Precautions

1. Switch off equipment before connecting cables.
2. Avoid excessive force on ports.
3. Use correct drivers.
4. Keep connectors clean.

Procedure

1. Identify the device.
2. Connect it correctly.
3. Install drivers if required.
4. Test functionality.
5. Record observations.

Observation Table

Sr.	Device	Interface	Status	Remarks
1				
2				
3				
4				
5				

Result

The device was connected, tested and verified successfully.

Viva Questions

- Differentiate USB 2.0 and USB 3.0.

- What is HDMI used for?
- What are common printer faults?
- Differentiate LCD and LED displays.
- What is the purpose of a graphics card?

Assignment

Prepare a comparison table of related devices with interfaces, advantages and applications.

Teacher's Remarks

Experiment 7: Display Cables and Connectors

Aim

To study and perform practical work on display cables and connectors.

Learning Outcomes

- Identify devices.
- Connect and configure correctly.
- Troubleshoot common faults.
- Follow safe laboratory practices.

Theory

Describe the working principle, types, specifications, applications, advantages and limitations of the device. Add labelled photographs and screenshots in the illustrated edition.

Apparatus Required

Desktop/Laptop, keyboard, mouse, monitor, printer, graphics card, cables, drivers and toolkit.

Precautions

1. Switch off equipment before connecting cables.
2. Avoid excessive force on ports.
3. Use correct drivers.
4. Keep connectors clean.

Procedure

1. Identify the device.
2. Connect it correctly.
3. Install drivers if required.
4. Test functionality.
5. Record observations.

Observation Table

Sr.	Device	Interface	Status	Remarks
1				
2				
3				
4				
5				

Result

The device was connected, tested and verified successfully.

Viva Questions

- Differentiate USB 2.0 and USB 3.0.

- What is HDMI used for?
- What are common printer faults?
- Differentiate LCD and LED displays.
- What is the purpose of a graphics card?

Assignment

Prepare a comparison table of related devices with interfaces, advantages and applications.

Teacher's Remarks

Experiment 8: Study of Dot Matrix, Inkjet, LaserJet and MFP Printers

Aim

To study and perform practical work on study of dot matrix, inkjet, laserjet and mfp printers.

Learning Outcomes

- Identify devices.
- Connect and configure correctly.
- Troubleshoot common faults.
- Follow safe laboratory practices.

Theory

Describe the working principle, types, specifications, applications, advantages and limitations of the device. Add labelled photographs and screenshots in the illustrated edition.

Apparatus Required

Desktop/Laptop, keyboard, mouse, monitor, printer, graphics card, cables, drivers and toolkit.

Precautions

1. Switch off equipment before connecting cables.
2. Avoid excessive force on ports.
3. Use correct drivers.
4. Keep connectors clean.

Procedure

1. Identify the device.
2. Connect it correctly.
3. Install drivers if required.
4. Test functionality.
5. Record observations.

Observation Table

Sr.	Device	Interface	Status	Remarks
1				
2				
3				
4				
5				

Result

The device was connected, tested and verified successfully.

Viva Questions

- Differentiate USB 2.0 and USB 3.0.
- What is HDMI used for?
- What are common printer faults?
- Differentiate LCD and LED displays.
- What is the purpose of a graphics card?

Assignment

Prepare a comparison table of related devices with interfaces, advantages and applications.

Teacher's Remarks

Experiment 9: Printer Installation and Driver Configuration

Aim

To study and perform practical work on printer installation and driver configuration.

Learning Outcomes

- Identify devices.
- Connect and configure correctly.
- Troubleshoot common faults.
- Follow safe laboratory practices.

Theory

Describe the working principle, types, specifications, applications, advantages and limitations of the device. Add labelled photographs and screenshots in the illustrated edition.

Apparatus Required

Desktop/Laptop, keyboard, mouse, monitor, printer, graphics card, cables, drivers and toolkit.

Precautions

1. Switch off equipment before connecting cables.
2. Avoid excessive force on ports.
3. Use correct drivers.
4. Keep connectors clean.

Procedure

1. Identify the device.
2. Connect it correctly.
3. Install drivers if required.
4. Test functionality.
5. Record observations.

Observation Table

Sr.	Device	Interface	Status	Remarks
1				
2				
3				
4				
5				

Result

The device was connected, tested and verified successfully.

Viva Questions

- Differentiate USB 2.0 and USB 3.0.

- What is HDMI used for?
- What are common printer faults?
- Differentiate LCD and LED displays.
- What is the purpose of a graphics card?

Assignment

Prepare a comparison table of related devices with interfaces, advantages and applications.

Teacher's Remarks

Experiment 10: Printer Troubleshooting

Aim

To study and perform practical work on printer troubleshooting.

Learning Outcomes

- Identify devices.
- Connect and configure correctly.
- Troubleshoot common faults.
- Follow safe laboratory practices.

Theory

Describe the working principle, types, specifications, applications, advantages and limitations of the device. Add labelled photographs and screenshots in the illustrated edition.

Apparatus Required

Desktop/Laptop, keyboard, mouse, monitor, printer, graphics card, cables, drivers and toolkit.

Precautions

1. Switch off equipment before connecting cables.
2. Avoid excessive force on ports.
3. Use correct drivers.
4. Keep connectors clean.

Procedure

1. Identify the device.
2. Connect it correctly.
3. Install drivers if required.
4. Test functionality.
5. Record observations.

Observation Table

Sr.	Device	Interface	Status	Remarks
1				
2				
3				
4				
5				

Result

The device was connected, tested and verified successfully.

Viva Questions

- Differentiate USB 2.0 and USB 3.0.

- What is HDMI used for?
- What are common printer faults?
- Differentiate LCD and LED displays.
- What is the purpose of a graphics card?

Assignment

Prepare a comparison table of related devices with interfaces, advantages and applications.

Teacher's Remarks

Experiment 11: Study of Graphics Cards

Aim

To study and perform practical work on study of graphics cards.

Learning Outcomes

- Identify devices.
- Connect and configure correctly.
- Troubleshoot common faults.
- Follow safe laboratory practices.

Theory

Describe the working principle, types, specifications, applications, advantages and limitations of the device. Add labelled photographs and screenshots in the illustrated edition.

Apparatus Required

Desktop/Laptop, keyboard, mouse, monitor, printer, graphics card, cables, drivers and toolkit.

Precautions

1. Switch off equipment before connecting cables.
2. Avoid excessive force on ports.
3. Use correct drivers.
4. Keep connectors clean.

Procedure

1. Identify the device.
2. Connect it correctly.
3. Install drivers if required.
4. Test functionality.
5. Record observations.

Observation Table

Sr.	Device	Interface	Status	Remarks
1				
2				
3				
4				
5				

Result

The device was connected, tested and verified successfully.

Viva Questions

- Differentiate USB 2.0 and USB 3.0.

- What is HDMI used for?
- What are common printer faults?
- Differentiate LCD and LED displays.
- What is the purpose of a graphics card?

Assignment

Prepare a comparison table of related devices with interfaces, advantages and applications.

Teacher's Remarks

Experiment 12: Interfacing and Testing Peripheral Devices

Aim

To study and perform practical work on interfacing and testing peripheral devices.

Learning Outcomes

- Identify devices.
- Connect and configure correctly.
- Troubleshoot common faults.
- Follow safe laboratory practices.

Theory

Describe the working principle, types, specifications, applications, advantages and limitations of the device. Add labelled photographs and screenshots in the illustrated edition.

Apparatus Required

Desktop/Laptop, keyboard, mouse, monitor, printer, graphics card, cables, drivers and toolkit.

Precautions

1. Switch off equipment before connecting cables.
2. Avoid excessive force on ports.
3. Use correct drivers.
4. Keep connectors clean.

Procedure

1. Identify the device.
2. Connect it correctly.
3. Install drivers if required.
4. Test functionality.
5. Record observations.

Observation Table

Sr.	Device	Interface	Status	Remarks
1				
2				
3				
4				
5				

Result

The device was connected, tested and verified successfully.

Viva Questions

- Differentiate USB 2.0 and USB 3.0.

- What is HDMI used for?
- What are common printer faults?
- Differentiate LCD and LED displays.
- What is the purpose of a graphics card?

Assignment

Prepare a comparison table of related devices with interfaces, advantages and applications.

Teacher's Remarks

Computer Workshop Lab Manual

Unit IV: Maintenance and Troubleshooting

Unit IV Overview

This unit focuses on preventive maintenance, computer cleaning, BIOS settings, diagnostics, troubleshooting techniques, operating system recovery, virus protection, backup procedures, and basic maintenance tools.

Experiment 1: Cleaning and Preventive Maintenance of a Desktop Computer

Aim

To perform maintenance and troubleshooting related to cleaning and preventive maintenance of a desktop computer.

Learning Outcomes

- Perform preventive maintenance.
- Diagnose common hardware/software faults.
- Apply corrective actions safely.
- Maintain service records.

Theory

Explain the purpose, principles, required tools, common faults, troubleshooting methods, and best practices related to this experiment. Add screenshots and photographs in the final illustrated edition.

Apparatus Required

Desktop/Laptop, cleaning kit, compressed air blower, screwdrivers, antivirus software, bootable USB, diagnostic utilities, and maintenance checklist.

Precautions

1. Disconnect power before servicing.
2. Wear an anti-static wrist strap.
3. Keep liquids away from electronic components.
4. Use genuine software and drivers.
5. Back up important data before maintenance.

Procedure

1. Identify the problem or maintenance task.
2. Inspect the hardware/software.
3. Perform the required maintenance or troubleshooting.
4. Verify proper system operation.
5. Record observations and corrective actions.

Observation Table

Sr. No.	Problem / Task	Cause	Action Taken	Status
1				
2				
3				
4				
5				

Result

The maintenance/troubleshooting activity was completed successfully and the system was verified.

Viva Questions

- What is preventive maintenance?
- Why is BIOS important?
- What causes a computer to fail during boot?
- Why should antivirus software be updated regularly?
- What is the purpose of data backup?

Assignment

Prepare a maintenance schedule for a computer laboratory and list common faults with their possible solutions.

Teacher's Remarks

Experiment 2: Cleaning and Maintenance of a Laptop

Aim

To perform maintenance and troubleshooting related to cleaning and maintenance of a laptop.

Learning Outcomes

- Perform preventive maintenance.
- Diagnose common hardware/software faults.
- Apply corrective actions safely.
- Maintain service records.

Theory

Explain the purpose, principles, required tools, common faults, troubleshooting methods, and best practices related to this experiment. Add screenshots and photographs in the final illustrated edition.

Apparatus Required

Desktop/Laptop, cleaning kit, compressed air blower, screwdrivers, antivirus software, bootable USB, diagnostic utilities, and maintenance checklist.

Precautions

1. Disconnect power before servicing.
2. Wear an anti-static wrist strap.
3. Keep liquids away from electronic components.
4. Use genuine software and drivers.
5. Back up important data before maintenance.

Procedure

1. Identify the problem or maintenance task.
2. Inspect the hardware/software.
3. Perform the required maintenance or troubleshooting.
4. Verify proper system operation.
5. Record observations and corrective actions.

Observation Table

Sr. No.	Problem / Task	Cause	Action Taken	Status
1				
2				
3				
4				
5				

Result

The maintenance/troubleshooting activity was completed successfully and the system was verified.

Viva Questions

- What is preventive maintenance?
- Why is BIOS important?
- What causes a computer to fail during boot?
- Why should antivirus software be updated regularly?
- What is the purpose of data backup?

Assignment

Prepare a maintenance schedule for a computer laboratory and list common faults with their possible solutions.

Teacher's Remarks

Experiment 3: BIOS Setup and Configuration

Aim

To perform maintenance and troubleshooting related to bios setup and configuration.

Learning Outcomes

- Perform preventive maintenance.
- Diagnose common hardware/software faults.
- Apply corrective actions safely.
- Maintain service records.

Theory

Explain the purpose, principles, required tools, common faults, troubleshooting methods, and best practices related to this experiment. Add screenshots and photographs in the final illustrated edition.

Apparatus Required

Desktop/Laptop, cleaning kit, compressed air blower, screwdrivers, antivirus software, bootable USB, diagnostic utilities, and maintenance checklist.

Precautions

1. Disconnect power before servicing.
2. Wear an anti-static wrist strap.
3. Keep liquids away from electronic components.
4. Use genuine software and drivers.
5. Back up important data before maintenance.

Procedure

1. Identify the problem or maintenance task.
2. Inspect the hardware/software.
3. Perform the required maintenance or troubleshooting.
4. Verify proper system operation.
5. Record observations and corrective actions.

Observation Table

Sr. No.	Problem / Task	Cause	Action Taken	Status
1				
2				
3				
4				
5				

Result

The maintenance/troubleshooting activity was completed successfully and the system was verified.

Viva Questions

- What is preventive maintenance?
- Why is BIOS important?
- What causes a computer to fail during boot?
- Why should antivirus software be updated regularly?
- What is the purpose of data backup?

Assignment

Prepare a maintenance schedule for a computer laboratory and list common faults with their possible solutions.

Teacher's Remarks

Experiment 4: Identification and Use of Diagnostic Tools

Aim

To perform maintenance and troubleshooting related to identification and use of diagnostic tools.

Learning Outcomes

- Perform preventive maintenance.
- Diagnose common hardware/software faults.
- Apply corrective actions safely.
- Maintain service records.

Theory

Explain the purpose, principles, required tools, common faults, troubleshooting methods, and best practices related to this experiment. Add screenshots and photographs in the final illustrated edition.

Apparatus Required

Desktop/Laptop, cleaning kit, compressed air blower, screwdrivers, antivirus software, bootable USB, diagnostic utilities, and maintenance checklist.

Precautions

1. Disconnect power before servicing.
2. Wear an anti-static wrist strap.
3. Keep liquids away from electronic components.
4. Use genuine software and drivers.
5. Back up important data before maintenance.

Procedure

1. Identify the problem or maintenance task.
2. Inspect the hardware/software.
3. Perform the required maintenance or troubleshooting.
4. Verify proper system operation.
5. Record observations and corrective actions.

Observation Table

Sr. No.	Problem / Task	Cause	Action Taken	Status
1				
2				
3				
4				
5				

Result

The maintenance/troubleshooting activity was completed successfully and the system was verified.

Viva Questions

- What is preventive maintenance?
- Why is BIOS important?
- What causes a computer to fail during boot?
- Why should antivirus software be updated regularly?
- What is the purpose of data backup?

Assignment

Prepare a maintenance schedule for a computer laboratory and list common faults with their possible solutions.

Teacher's Remarks

Experiment 5: Troubleshooting Booting Problems

Aim

To perform maintenance and troubleshooting related to troubleshooting booting problems.

Learning Outcomes

- Perform preventive maintenance.
- Diagnose common hardware/software faults.
- Apply corrective actions safely.
- Maintain service records.

Theory

Explain the purpose, principles, required tools, common faults, troubleshooting methods, and best practices related to this experiment. Add screenshots and photographs in the final illustrated edition.

Apparatus Required

Desktop/Laptop, cleaning kit, compressed air blower, screwdrivers, antivirus software, bootable USB, diagnostic utilities, and maintenance checklist.

Precautions

1. Disconnect power before servicing.
2. Wear an anti-static wrist strap.
3. Keep liquids away from electronic components.
4. Use genuine software and drivers.
5. Back up important data before maintenance.

Procedure

1. Identify the problem or maintenance task.
2. Inspect the hardware/software.
3. Perform the required maintenance or troubleshooting.
4. Verify proper system operation.
5. Record observations and corrective actions.

Observation Table

Sr. No.	Problem / Task	Cause	Action Taken	Status
1				
2				
3				
4				
5				

Result

The maintenance/troubleshooting activity was completed successfully and the system was verified.

Viva Questions

- What is preventive maintenance?
- Why is BIOS important?
- What causes a computer to fail during boot?
- Why should antivirus software be updated regularly?
- What is the purpose of data backup?

Assignment

Prepare a maintenance schedule for a computer laboratory and list common faults with their possible solutions.

Teacher's Remarks

Experiment 6: Troubleshooting Display and Power Problems

Aim

To perform maintenance and troubleshooting related to troubleshooting display and power problems.

Learning Outcomes

- Perform preventive maintenance.
- Diagnose common hardware/software faults.
- Apply corrective actions safely.
- Maintain service records.

Theory

Explain the purpose, principles, required tools, common faults, troubleshooting methods, and best practices related to this experiment. Add screenshots and photographs in the final illustrated edition.

Apparatus Required

Desktop/Laptop, cleaning kit, compressed air blower, screwdrivers, antivirus software, bootable USB, diagnostic utilities, and maintenance checklist.

Precautions

1. Disconnect power before servicing.
2. Wear an anti-static wrist strap.
3. Keep liquids away from electronic components.
4. Use genuine software and drivers.
5. Back up important data before maintenance.

Procedure

1. Identify the problem or maintenance task.
2. Inspect the hardware/software.
3. Perform the required maintenance or troubleshooting.
4. Verify proper system operation.
5. Record observations and corrective actions.

Observation Table

Sr. No.	Problem / Task	Cause	Action Taken	Status
1				
2				
3				
4				
5				

Result

The maintenance/troubleshooting activity was completed successfully and the system was verified.

Viva Questions

- What is preventive maintenance?
- Why is BIOS important?
- What causes a computer to fail during boot?
- Why should antivirus software be updated regularly?
- What is the purpose of data backup?

Assignment

Prepare a maintenance schedule for a computer laboratory and list common faults with their possible solutions.

Teacher's Remarks

Experiment 7: Troubleshooting Keyboard and Mouse Faults

Aim

To perform maintenance and troubleshooting related to troubleshooting keyboard and mouse faults.

Learning Outcomes

- Perform preventive maintenance.
- Diagnose common hardware/software faults.
- Apply corrective actions safely.
- Maintain service records.

Theory

Explain the purpose, principles, required tools, common faults, troubleshooting methods, and best practices related to this experiment. Add screenshots and photographs in the final illustrated edition.

Apparatus Required

Desktop/Laptop, cleaning kit, compressed air blower, screwdrivers, antivirus software, bootable USB, diagnostic utilities, and maintenance checklist.

Precautions

1. Disconnect power before servicing.
2. Wear an anti-static wrist strap.
3. Keep liquids away from electronic components.
4. Use genuine software and drivers.
5. Back up important data before maintenance.

Procedure

1. Identify the problem or maintenance task.
2. Inspect the hardware/software.
3. Perform the required maintenance or troubleshooting.
4. Verify proper system operation.
5. Record observations and corrective actions.

Observation Table

Sr. No.	Problem / Task	Cause	Action Taken	Status
1				
2				
3				
4				
5				

Result

The maintenance/troubleshooting activity was completed successfully and the system was verified.

Viva Questions

- What is preventive maintenance?
- Why is BIOS important?
- What causes a computer to fail during boot?
- Why should antivirus software be updated regularly?
- What is the purpose of data backup?

Assignment

Prepare a maintenance schedule for a computer laboratory and list common faults with their possible solutions.

Teacher's Remarks

Experiment 8: Scanning and Removing Computer Viruses

Aim

To perform maintenance and troubleshooting related to scanning and removing computer viruses.

Learning Outcomes

- Perform preventive maintenance.
- Diagnose common hardware/software faults.
- Apply corrective actions safely.
- Maintain service records.

Theory

Explain the purpose, principles, required tools, common faults, troubleshooting methods, and best practices related to this experiment. Add screenshots and photographs in the final illustrated edition.

Apparatus Required

Desktop/Laptop, cleaning kit, compressed air blower, screwdrivers, antivirus software, bootable USB, diagnostic utilities, and maintenance checklist.

Precautions

1. Disconnect power before servicing.
2. Wear an anti-static wrist strap.
3. Keep liquids away from electronic components.
4. Use genuine software and drivers.
5. Back up important data before maintenance.

Procedure

1. Identify the problem or maintenance task.
2. Inspect the hardware/software.
3. Perform the required maintenance or troubleshooting.
4. Verify proper system operation.
5. Record observations and corrective actions.

Observation Table

Sr. No.	Problem / Task	Cause	Action Taken	Status
1				
2				
3				
4				
5				

Result

The maintenance/troubleshooting activity was completed successfully and the system was verified.

Viva Questions

- What is preventive maintenance?
- Why is BIOS important?
- What causes a computer to fail during boot?
- Why should antivirus software be updated regularly?
- What is the purpose of data backup?

Assignment

Prepare a maintenance schedule for a computer laboratory and list common faults with their possible solutions.

Teacher's Remarks

Experiment 9: Data Backup and System Restore

Aim

To perform maintenance and troubleshooting related to data backup and system restore.

Learning Outcomes

- Perform preventive maintenance.
- Diagnose common hardware/software faults.
- Apply corrective actions safely.
- Maintain service records.

Theory

Explain the purpose, principles, required tools, common faults, troubleshooting methods, and best practices related to this experiment. Add screenshots and photographs in the final illustrated edition.

Apparatus Required

Desktop/Laptop, cleaning kit, compressed air blower, screwdrivers, antivirus software, bootable USB, diagnostic utilities, and maintenance checklist.

Precautions

1. Disconnect power before servicing.
2. Wear an anti-static wrist strap.
3. Keep liquids away from electronic components.
4. Use genuine software and drivers.
5. Back up important data before maintenance.

Procedure

1. Identify the problem or maintenance task.
2. Inspect the hardware/software.
3. Perform the required maintenance or troubleshooting.
4. Verify proper system operation.
5. Record observations and corrective actions.

Observation Table

Sr. No.	Problem / Task	Cause	Action Taken	Status
1				
2				
3				
4				
5				

Result

The maintenance/troubleshooting activity was completed successfully and the system was verified.

Viva Questions

- What is preventive maintenance?
- Why is BIOS important?
- What causes a computer to fail during boot?
- Why should antivirus software be updated regularly?
- What is the purpose of data backup?

Assignment

Prepare a maintenance schedule for a computer laboratory and list common faults with their possible solutions.

Teacher's Remarks

Experiment 10: Preventive Maintenance Checklist and System Health Report

Aim

To perform maintenance and troubleshooting related to preventive maintenance checklist and system health report.

Learning Outcomes

- Perform preventive maintenance.
- Diagnose common hardware/software faults.
- Apply corrective actions safely.
- Maintain service records.

Theory

Explain the purpose, principles, required tools, common faults, troubleshooting methods, and best practices related to this experiment. Add screenshots and photographs in the final illustrated edition.

Apparatus Required

Desktop/Laptop, cleaning kit, compressed air blower, screwdrivers, antivirus software, bootable USB, diagnostic utilities, and maintenance checklist.

Precautions

1. Disconnect power before servicing.
2. Wear an anti-static wrist strap.
3. Keep liquids away from electronic components.
4. Use genuine software and drivers.
5. Back up important data before maintenance.

Procedure

1. Identify the problem or maintenance task.
2. Inspect the hardware/software.
3. Perform the required maintenance or troubleshooting.
4. Verify proper system operation.
5. Record observations and corrective actions.

Observation Table

Sr. No.	Problem / Task	Cause	Action Taken	Status
1				
2				
3				
4				
5				

Result

The maintenance/troubleshooting activity was completed successfully and the system was verified.

Viva Questions

- What is preventive maintenance?
- Why is BIOS important?
- What causes a computer to fail during boot?
- Why should antivirus software be updated regularly?
- What is the purpose of data backup?

Assignment

Prepare a maintenance schedule for a computer laboratory and list common faults with their possible solutions.

Teacher's Remarks

Computer Workshop Lab Manual

Unit V: PC Assembly, Windows/Linux Installation, and Software Installation

Unit V Overview

This unit provides hands-on practice in assembling a personal computer, installing Windows and Linux operating systems, configuring device drivers, installing application software, and verifying system functionality.

Experiment 1: Complete Desktop PC Assembly

Aim

To perform practical work on complete desktop pc assembly.

Learning Outcomes

- Assemble and configure a computer system.
- Install operating systems and software.
- Configure hardware drivers.
- Verify system performance after installation.

Theory

Explain the concepts related to PC assembly, operating system installation, software installation, boot process, partitioning, file systems, drivers, and post-installation testing. Add screenshots in the illustrated edition.

Apparatus Required

Desktop computer, motherboard, processor, RAM, HDD/SSD, SMPS, cabinet, bootable Windows/Linux USB drive, drivers, application software and toolkit.

Precautions

1. Disconnect power before assembly.
2. Wear an anti-static wrist strap.
3. Verify hardware compatibility.
4. Back up important data before OS installation.
5. Install only genuine software.

Procedure

1. Assemble or prepare the computer.
2. Configure BIOS if required.
3. Install the operating system.
4. Install drivers and application software.
5. Verify successful installation and record observations.

Observation Table

Sr. No.	Task	Status	Observation	Remarks
1				
2				
3				
4				
5				

Result

The assembly/installation task was completed successfully and the computer system was functioning correctly.

Viva Questions

- What is the purpose of BIOS?
- What is a bootable USB drive?
- Differentiate Windows and Linux.
- Why are device drivers required?
- What should be checked after installing an operating system?

Assignment

Prepare a detailed flowchart showing the complete sequence of PC assembly, operating system installation, driver installation, and software installation.

Teacher's Remarks

Experiment 2: Disassembly and Reassembly of Desktop Computer

Aim

To perform practical work on disassembly and reassembly of desktop computer.

Learning Outcomes

- Assemble and configure a computer system.
- Install operating systems and software.
- Configure hardware drivers.
- Verify system performance after installation.

Theory

Explain the concepts related to PC assembly, operating system installation, software installation, boot process, partitioning, file systems, drivers, and post-installation testing. Add screenshots in the illustrated edition.

Apparatus Required

Desktop computer, motherboard, processor, RAM, HDD/SSD, SMPS, cabinet, bootable Windows/Linux USB drive, drivers, application software and toolkit.

Precautions

1. Disconnect power before assembly.
2. Wear an anti-static wrist strap.
3. Verify hardware compatibility.
4. Back up important data before OS installation.
5. Install only genuine software.

Procedure

1. Assemble or prepare the computer.
2. Configure BIOS if required.
3. Install the operating system.
4. Install drivers and application software.
5. Verify successful installation and record observations.

Observation Table

Sr. No.	Task	Status	Observation	Remarks
1				
2				
3				
4				
5				

Result

The assembly/installation task was completed successfully and the computer system was functioning correctly.

Viva Questions

- What is the purpose of BIOS?
- What is a bootable USB drive?
- Differentiate Windows and Linux.
- Why are device drivers required?
- What should be checked after installing an operating system?

Assignment

Prepare a detailed flowchart showing the complete sequence of PC assembly, operating system installation, driver installation, and software installation.

Teacher's Remarks

Experiment 3: BIOS Configuration Before OS Installation

Aim

To perform practical work on bios configuration before os installation.

Learning Outcomes

- Assemble and configure a computer system.
- Install operating systems and software.
- Configure hardware drivers.
- Verify system performance after installation.

Theory

Explain the concepts related to PC assembly, operating system installation, software installation, boot process, partitioning, file systems, drivers, and post-installation testing. Add screenshots in the illustrated edition.

Apparatus Required

Desktop computer, motherboard, processor, RAM, HDD/SSD, SMPS, cabinet, bootable Windows/Linux USB drive, drivers, application software and toolkit.

Precautions

1. Disconnect power before assembly.
2. Wear an anti-static wrist strap.
3. Verify hardware compatibility.
4. Back up important data before OS installation.
5. Install only genuine software.

Procedure

1. Assemble or prepare the computer.
2. Configure BIOS if required.
3. Install the operating system.
4. Install drivers and application software.
5. Verify successful installation and record observations.

Observation Table

Sr. No.	Task	Status	Observation	Remarks
1				
2				
3				
4				
5				

Result

The assembly/installation task was completed successfully and the computer system was functioning correctly.

Viva Questions

- What is the purpose of BIOS?
- What is a bootable USB drive?
- Differentiate Windows and Linux.
- Why are device drivers required?
- What should be checked after installing an operating system?

Assignment

Prepare a detailed flowchart showing the complete sequence of PC assembly, operating system installation, driver installation, and software installation.

Teacher's Remarks

Experiment 4: Installation of Microsoft Windows Operating System

Aim

To perform practical work on installation of microsoft windows operating system.

Learning Outcomes

- Assemble and configure a computer system.
- Install operating systems and software.
- Configure hardware drivers.
- Verify system performance after installation.

Theory

Explain the concepts related to PC assembly, operating system installation, software installation, boot process, partitioning, file systems, drivers, and post-installation testing. Add screenshots in the illustrated edition.

Apparatus Required

Desktop computer, motherboard, processor, RAM, HDD/SSD, SMPS, cabinet, bootable Windows/Linux USB drive, drivers, application software and toolkit.

Precautions

1. Disconnect power before assembly.
2. Wear an anti-static wrist strap.
3. Verify hardware compatibility.
4. Back up important data before OS installation.
5. Install only genuine software.

Procedure

1. Assemble or prepare the computer.
2. Configure BIOS if required.
3. Install the operating system.
4. Install drivers and application software.
5. Verify successful installation and record observations.

Observation Table

Sr. No.	Task	Status	Observation	Remarks
1				
2				
3				
4				
5				

Result

The assembly/installation task was completed successfully and the computer system was functioning correctly.

Viva Questions

- What is the purpose of BIOS?
- What is a bootable USB drive?
- Differentiate Windows and Linux.
- Why are device drivers required?
- What should be checked after installing an operating system?

Assignment

Prepare a detailed flowchart showing the complete sequence of PC assembly, operating system installation, driver installation, and software installation.

Teacher's Remarks

Experiment 5: Installation of Linux Operating System (Ubuntu)

Aim

To perform practical work on installation of linux operating system (ubuntu).

Learning Outcomes

- Assemble and configure a computer system.
- Install operating systems and software.
- Configure hardware drivers.
- Verify system performance after installation.

Theory

Explain the concepts related to PC assembly, operating system installation, software installation, boot process, partitioning, file systems, drivers, and post-installation testing. Add screenshots in the illustrated edition.

Apparatus Required

Desktop computer, motherboard, processor, RAM, HDD/SSD, SMPS, cabinet, bootable Windows/Linux USB drive, drivers, application software and toolkit.

Precautions

1. Disconnect power before assembly.
2. Wear an anti-static wrist strap.
3. Verify hardware compatibility.
4. Back up important data before OS installation.
5. Install only genuine software.

Procedure

1. Assemble or prepare the computer.
2. Configure BIOS if required.
3. Install the operating system.
4. Install drivers and application software.
5. Verify successful installation and record observations.

Observation Table

Sr. No.	Task	Status	Observation	Remarks
1				
2				
3				
4				
5				

Result

The assembly/installation task was completed successfully and the computer system was functioning correctly.

Viva Questions

- What is the purpose of BIOS?
- What is a bootable USB drive?
- Differentiate Windows and Linux.
- Why are device drivers required?
- What should be checked after installing an operating system?

Assignment

Prepare a detailed flowchart showing the complete sequence of PC assembly, operating system installation, driver installation, and software installation.

Teacher's Remarks

Experiment 6: Installation of Device Drivers

Aim

To perform practical work on installation of device drivers.

Learning Outcomes

- Assemble and configure a computer system.
- Install operating systems and software.
- Configure hardware drivers.
- Verify system performance after installation.

Theory

Explain the concepts related to PC assembly, operating system installation, software installation, boot process, partitioning, file systems, drivers, and post-installation testing. Add screenshots in the illustrated edition.

Apparatus Required

Desktop computer, motherboard, processor, RAM, HDD/SSD, SMPS, cabinet, bootable Windows/Linux USB drive, drivers, application software and toolkit.

Precautions

1. Disconnect power before assembly.
2. Wear an anti-static wrist strap.
3. Verify hardware compatibility.
4. Back up important data before OS installation.
5. Install only genuine software.

Procedure

1. Assemble or prepare the computer.
2. Configure BIOS if required.
3. Install the operating system.
4. Install drivers and application software.
5. Verify successful installation and record observations.

Observation Table

Sr. No.	Task	Status	Observation	Remarks
1				
2				
3				
4				
5				

Result

The assembly/installation task was completed successfully and the computer system was functioning correctly.

Viva Questions

- What is the purpose of BIOS?
- What is a bootable USB drive?
- Differentiate Windows and Linux.
- Why are device drivers required?
- What should be checked after installing an operating system?

Assignment

Prepare a detailed flowchart showing the complete sequence of PC assembly, operating system installation, driver installation, and software installation.

Teacher's Remarks

Experiment 7: Installation of Application Software and Utilities

Aim

To perform practical work on installation of application software and utilities.

Learning Outcomes

- Assemble and configure a computer system.
- Install operating systems and software.
- Configure hardware drivers.
- Verify system performance after installation.

Theory

Explain the concepts related to PC assembly, operating system installation, software installation, boot process, partitioning, file systems, drivers, and post-installation testing. Add screenshots in the illustrated edition.

Apparatus Required

Desktop computer, motherboard, processor, RAM, HDD/SSD, SMPS, cabinet, bootable Windows/Linux USB drive, drivers, application software and toolkit.

Precautions

1. Disconnect power before assembly.
2. Wear an anti-static wrist strap.
3. Verify hardware compatibility.
4. Back up important data before OS installation.
5. Install only genuine software.

Procedure

1. Assemble or prepare the computer.
2. Configure BIOS if required.
3. Install the operating system.
4. Install drivers and application software.
5. Verify successful installation and record observations.

Observation Table

Sr. No.	Task	Status	Observation	Remarks
1				
2				
3				
4				
5				

Result

The assembly/installation task was completed successfully and the computer system was functioning correctly.

Viva Questions

- What is the purpose of BIOS?
- What is a bootable USB drive?
- Differentiate Windows and Linux.
- Why are device drivers required?
- What should be checked after installing an operating system?

Assignment

Prepare a detailed flowchart showing the complete sequence of PC assembly, operating system installation, driver installation, and software installation.

Teacher's Remarks

Experiment 8: Creation of Bootable USB Drive and System Recovery

Aim

To perform practical work on creation of bootable usb drive and system recovery.

Learning Outcomes

- Assemble and configure a computer system.
- Install operating systems and software.
- Configure hardware drivers.
- Verify system performance after installation.

Theory

Explain the concepts related to PC assembly, operating system installation, software installation, boot process, partitioning, file systems, drivers, and post-installation testing. Add screenshots in the illustrated edition.

Apparatus Required

Desktop computer, motherboard, processor, RAM, HDD/SSD, SMPS, cabinet, bootable Windows/Linux USB drive, drivers, application software and toolkit.

Precautions

1. Disconnect power before assembly.
2. Wear an anti-static wrist strap.
3. Verify hardware compatibility.
4. Back up important data before OS installation.
5. Install only genuine software.

Procedure

1. Assemble or prepare the computer.
2. Configure BIOS if required.
3. Install the operating system.
4. Install drivers and application software.
5. Verify successful installation and record observations.

Observation Table

Sr. No.	Task	Status	Observation	Remarks
1				
2				
3				
4				
5				

Result

The assembly/installation task was completed successfully and the computer system was functioning correctly.

Viva Questions

- What is the purpose of BIOS?
- What is a bootable USB drive?
- Differentiate Windows and Linux.
- Why are device drivers required?
- What should be checked after installing an operating system?

Assignment

Prepare a detailed flowchart showing the complete sequence of PC assembly, operating system installation, driver installation, and software installation.

Teacher's Remarks

Experiment 9: System Testing, Performance Verification and Documentation

Aim

To perform practical work on system testing, performance verification and documentation.

Learning Outcomes

- Assemble and configure a computer system.
- Install operating systems and software.
- Configure hardware drivers.
- Verify system performance after installation.

Theory

Explain the concepts related to PC assembly, operating system installation, software installation, boot process, partitioning, file systems, drivers, and post-installation testing. Add screenshots in the illustrated edition.

Apparatus Required

Desktop computer, motherboard, processor, RAM, HDD/SSD, SMPS, cabinet, bootable Windows/Linux USB drive, drivers, application software and toolkit.

Precautions

1. Disconnect power before assembly.
2. Wear an anti-static wrist strap.
3. Verify hardware compatibility.
4. Back up important data before OS installation.
5. Install only genuine software.

Procedure

1. Assemble or prepare the computer.
2. Configure BIOS if required.
3. Install the operating system.
4. Install drivers and application software.
5. Verify successful installation and record observations.

Observation Table

Sr. No.	Task	Status	Observation	Remarks
1				
2				
3				
4				
5				

Result

The assembly/installation task was completed successfully and the computer system was functioning correctly.

Viva Questions

- What is the purpose of BIOS?
- What is a bootable USB drive?
- Differentiate Windows and Linux.
- Why are device drivers required?
- What should be checked after installing an operating system?

Assignment

Prepare a detailed flowchart showing the complete sequence of PC assembly, operating system installation, driver installation, and software installation.

Teacher's Remarks
