



COMPUTER & IT FUNDAMENTALS LAB MANUAL

Including Introduction to Artificial Intelligence

Total Practicals	15 Practicals
Subjects Covered	Computer Fundamentals, MS Office, Networking, AI
Academic Year	2025 – 2026
Department	Computer Science / Information Technology

Student Name: _____
Roll Number: _____
Class & Section: _____
Teacher's Name: _____

INDEX

Sr.	Practical Title	Date	Sign
1	Introduction to Computer & IT Lab Safety		
2	Hardware Identification: CPU, RAM, HDD & Peripherals		
3	Operating System: Windows Installation & Setup		
4	Windows Desktop, Taskbar & File Management		
5	MS Word: Formatting, Tables & Mail Merge		
6	MS Word: Headers, Footers, Page Layout & Printing		
7	MS Excel: Data Entry, Formulas & Functions		
8	MS Excel: Charts, Graphs & Data Formatting		
9	MS PowerPoint: Slide Design & Presentation		
10	Internet Basics: Browser, Search & Email		
11	Cybersecurity: Password Safety & Safe Browsing		
12	Introduction to Networking: LAN, WAN & IP Address		
13	Input/Output Devices: Setup & Troubleshooting		
14	Antivirus, Software Installation & System Maintenance		
15	Introduction to Artificial Intelligence (AI)		

Practical 1: Introduction to Computer & IT Lab Safety

Practical No.	1
Title	Introduction to Computer & IT Lab Safety
Duration	2 Hours
Subject	Computer Fundamentals & IT

1.1 Aim

To familiarize students with the basic rules, regulations, and safety guidelines to be followed in the Computer and IT Laboratory.

1.2 Objectives

- Understand the importance of lab safety.
- Learn the do's and don'ts inside a computer lab.
- Identify potential hazards related to electrical and hardware equipment.
- Practice responsible usage of computer equipment and software.

1.3 Theory

A Computer Lab is a controlled environment equipped with computer systems, peripherals, networking equipment, and software tools. Maintaining safety and discipline ensures longevity of equipment, data security, and personal safety of users.

1.3.1 General Lab Rules

- No food or drinks allowed near computers.
- Never handle hardware components with wet hands.
- Always log off after completing your work session.
- Do not install unauthorized software without permission.
- Report any malfunctioning equipment immediately.
- Maintain silence and avoid unnecessary movement in the lab.
- Do not share passwords or access credentials.
- Save work frequently to prevent data loss.

1.3.2 Electrical Safety

- Ensure cables are not frayed or exposed.
- Do not overload electrical sockets.
- Switch off systems when not in use.
- Use surge protectors for all computer systems.

- Know the location of the main power switch and fire extinguisher.

1.3.3 Ergonomics & Health Safety

- Sit upright with feet flat on the floor.
- Keep the monitor at eye level, about 50–70 cm from eyes.
- Take breaks every 30–40 minutes to rest your eyes (follow the 20-20-20 rule).
- Adjust keyboard and mouse positions to avoid wrist strain.
- Ensure proper ventilation and lighting in the lab.

1.3.4 Data & Cybersecurity Safety

- Always use licensed, updated antivirus software.
- Do not open unknown email attachments or click suspicious links.
- Use strong passwords and change them regularly.
- Do not copy or distribute unauthorized software.
- Always backup important data.

1.4 Procedure

1. Read the lab rules displayed on the notice board.
2. Identify emergency exits, fire extinguisher, and first aid kit.
3. Check your assigned workstation for any visible damage.
4. Sign the log register before starting work.
5. Adjust your seating position ergonomically.
6. Switch on the system as directed by the instructor.
7. Log off and shut down the system after the session.

1.5 Precautions

- Never attempt to repair hardware on your own.
- Do not yank cables — always grip the connector.
- Do not leave systems unattended while logged in.
- Avoid touching the screen surface directly.

1.6 Conclusion

Understanding and following lab safety guidelines is fundamental to a productive and safe computing environment. Every student must adhere to these rules throughout all practical sessions.

1.7 Review Questions

8. List five important rules to follow in a computer lab.
9. What is the 20-20-20 rule? Why is it important?

10. What precautions should be taken regarding electrical safety?
11. Why should unauthorized software not be installed on lab computers?
12. What should you do in case of an electrical emergency?

Practical 2: Hardware Identification – CPU, RAM, HDD & Peripherals

Practical No.	2
Title	Hardware Identification: CPU, RAM, HDD & Peripherals
Duration	2 Hours
Subject	Computer Fundamentals & IT

2.1 Aim

To identify and study the major hardware components of a computer system, including internal and external devices.

2.2 Objectives

- Identify internal components: CPU, RAM, Motherboard, HDD/SSD, SMPS.
- Understand the function of each hardware component.
- Identify common peripheral devices: keyboard, mouse, monitor, printer, scanner.
- Learn how components are interconnected.

2.3 Theory

Computer hardware refers to the physical parts of a computer. These can be classified into internal (inside the cabinet) and external (peripherals) components.

2.3.1 Internal Components

Component	Full Form	Function
CPU	Central Processing Unit	Processes all instructions; brain of the computer
RAM	Random Access Memory	Temporary memory used during running programs
HDD/SSD	Hard/Solid State Drive	Permanent storage of OS, software, and data
Motherboard	—	Main circuit board connecting all components
SMPS	Switched Mode Power Supply	Converts AC to DC; powers all internal components
GPU	Graphics Processing Unit	Handles graphical output and rendering
ROM	Read Only Memory	Stores BIOS/UEFI firmware permanently

2.3.2 External Peripherals

Peripherals are devices connected externally to the computer for input, output, or storage.

- Input Devices: Keyboard, Mouse, Scanner, Webcam, Microphone, Joystick.
- Output Devices: Monitor, Printer, Speaker, Projector.
- Storage Devices: Pen Drive, External HDD, CD/DVD, Memory Card.
- Communication Devices: Modem, Network Card, Bluetooth Adapter.

2.3.3 Ports & Connectors

- USB (Universal Serial Bus): Connects most peripherals.
- HDMI: High Definition Media Interface for video/audio.
- VGA: Older video port.
- Ethernet (RJ-45): Network connectivity.
- Audio Jack (3.5mm): Headphones and microphone.
- PS/2: Legacy keyboard and mouse port.

2.4 Procedure

13. Observe the computer system provided by the instructor.
14. Identify and note each internal component on your worksheet.
15. Carefully open the computer cabinet (only if permitted) and point to each component.
16. Connect and disconnect a keyboard, mouse, and pen drive safely.
17. Note the specifications shown in System Properties (RAM, CPU type).

2.5 Observations

Component	Specification Observed	Remarks
CPU		
RAM		
Hard Disk		
Monitor		
Keyboard		
Mouse		

2.6 Conclusion

Students successfully identified and described the major internal and external hardware components of a computer. Understanding hardware forms the foundation for further studies in computer science and IT.

2.7 Review Questions

18. What is the role of RAM in a computer? How does it differ from HDD?

19. Name four input devices and four output devices.
20. What does SMPS stand for and what is its function?
21. Differentiate between HDD and SSD.
22. List three types of ports found on a typical desktop computer.

Practical 3: Operating System – Windows Installation & Setup

Practical No.	3
Title	Operating System: Windows Installation & Setup
Duration	3 Hours
Subject	Computer Fundamentals & IT

3.1 Aim

To understand the process of installing and setting up the Windows Operating System on a computer.

3.2 Objectives

- Understand what an Operating System (OS) is and its role.
- Identify the steps involved in Windows installation.
- Configure basic Windows settings after installation.
- Understand concepts of partitioning and formatting.

3.3 Theory

3.3.1 What is an Operating System?

An Operating System (OS) is system software that manages hardware resources and provides services for application programs. It acts as an intermediary between users and computer hardware. Examples: Windows, macOS, Linux, Android.

3.3.2 Types of Operating Systems

- Single-User OS: Designed for one user at a time (e.g., MS-DOS).
- Multi-User OS: Supports multiple users simultaneously (e.g., Unix).
- Multitasking OS: Runs multiple programs simultaneously (e.g., Windows 10/11).
- Real-Time OS: Used in embedded systems requiring immediate response.

3.3.3 Windows OS Versions

Version	Year Released	Key Feature
Windows XP	2001	Stable, widely used
Windows 7	2009	Improved UI, Aero Glass
Windows 8/8.1	2012/2013	Touch interface
Windows 10	2015	Cortana, Edge browser
Windows 11	2021	New UI, TPM 2.0 required

3.4 Prerequisites for Windows Installation

- Bootable USB drive or DVD with Windows installer.
- Minimum 64 GB storage, 4 GB RAM (Windows 10/11).
- Product activation key (if required).
- BIOS set to boot from USB/DVD.

3.5 Procedure

23. Insert the bootable USB drive or DVD into the computer.
24. Restart the computer and access BIOS/UEFI settings (press F2/Del/F12 during boot).
25. Set the boot priority to USB or DVD drive.
26. Save and exit BIOS. Windows Setup will load.
27. Select Language, Time format, and Keyboard layout. Click "Next".
28. Click "Install Now".
29. Enter the product key or skip if activating later.
30. Accept the License Agreement and click "Next".
31. Choose "Custom Installation" for a clean install.
32. Select or create a partition for Windows installation.
33. Click "Next" — Windows will begin copying files and restart several times.
34. Set up user account, password, and preferences.
35. Complete the setup and reach the Desktop.
36. Install drivers (graphics, network, audio) using device manager or manufacturer disc.

3.6 Post-Installation Configuration

- Activate Windows using a valid product key.
- Set correct date, time, and time zone.
- Connect to internet and run Windows Update.
- Install antivirus software.
- Install essential software (browser, MS Office, media player).
- Create system restore point.

3.7 Conclusion

Students successfully understood the Windows OS installation process, including BIOS configuration, partitioning, and post-installation setup. This knowledge is essential for IT professionals and technicians.

3.8 Review Questions

37. What is an Operating System? Name any four types.

38. What is BIOS and what is its role during Windows installation?
39. Differentiate between Upgrade Installation and Clean Installation.
40. What is disk partitioning? Why is it recommended?
41. List any four tasks to perform after Windows installation.

Practical 4: Windows Desktop, Taskbar & File Management

Practical No.	4
Title	Windows Desktop, Taskbar & File Management
Duration	2 Hours
Subject	Computer Fundamentals & IT

4.1 Aim

To explore the Windows Desktop environment and learn file management operations using Windows Explorer.

4.2 Objectives

- Understand the components of Windows Desktop and Taskbar.
- Navigate folders and drives using File Explorer.
- Perform file operations: create, rename, copy, move, delete.
- Understand the Recycle Bin and file properties.

4.3 Theory

4.3.1 Windows Desktop Components

- Desktop: The main working area, displays icons, wallpaper, and open windows.
- Icons: Shortcuts to programs, files, and folders.
- Taskbar: Horizontal bar at the bottom; shows Start button, open apps, system tray.
- Start Menu: Central hub for accessing all programs and settings.
- System Tray: Bottom right area showing clock, volume, network, and notification icons.
- Recycle Bin: Temporarily holds deleted files for recovery.

4.3.2 Windows File Explorer

File Explorer is the built-in file management tool in Windows. It allows users to navigate the file system, manage files and folders, access drives, and perform file operations.

- Navigation Pane: Left panel showing drives and quick access folders.
- Address Bar: Shows current directory path.
- Ribbon: Contains tools for file operations.
- Preview Pane: Shows file preview (can be toggled).

4.3.3 File & Folder Operations

Operation	Method 1	Keyboard Shortcut
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Copy	Right-click → Copy	Ctrl + C
Paste	Right-click → Paste	Ctrl + V
Cut (Move)	Right-click → Cut	Ctrl + X
Delete	Right-click → Delete	Delete Key
Rename	Right-click → Rename	F2
Select All	—	Ctrl + A
Undo	—	Ctrl + Z
New Folder	Right-click → New → Folder	Ctrl + Shift + N

4.4 Procedure

42. Right-click on Desktop → Personalize to change wallpaper and theme.
43. Open File Explorer using Windows + E shortcut.
44. Navigate to C: Drive → Users → [Username] folder.
45. Create a new folder named "MyPractical4" on the Desktop.
46. Inside it, create three sub-folders: Documents, Images, Videos.
47. Create a text file inside Documents using Notepad.
48. Copy the file to Images folder and rename it.
49. Delete the original file and verify it goes to Recycle Bin.
50. Restore it from Recycle Bin.
51. Check file properties by right-clicking → Properties.

4.5 Important Keyboard Shortcuts

Shortcut	Action
Win + D	Show/hide Desktop
Win + E	Open File Explorer
Win + L	Lock Screen
Alt + F4	Close active window
Win + R	Open Run dialog
Ctrl + Z	Undo last action
Ctrl + Y	Redo action
Win + Pause	Open System Properties

4.6 Conclusion

Students explored the Windows Desktop and Taskbar environment and successfully performed file management operations using File Explorer. Mastery of these skills is essential for efficient computer usage.

4.7 Review Questions

52. What is the purpose of the Recycle Bin? How do you permanently delete a file?
53. What is the difference between Cut and Copy operations?
54. How do you create a new folder? Name two methods.
55. What does the System Tray display?
56. List any five Windows keyboard shortcuts and their functions.

Practical 5: MS Word – Formatting, Tables & Mail Merge

Practical No.	5
Title	MS Word: Formatting, Tables & Mail Merge
Duration	3 Hours
Subject	Computer Fundamentals & IT

5.1 Aim

To learn text formatting, table creation, and the Mail Merge feature in Microsoft Word.

5.2 Objectives

- Apply text formatting: font, size, bold, italic, underline, color, alignment.
- Create and format tables in MS Word.
- Use the Mail Merge feature to generate personalized letters.
- Understand paragraph spacing, indentation, and line spacing.

5.3 Theory

5.3.1 Text Formatting

Text formatting controls the appearance of text in a document. Key formatting options include:

- Font & Size: Changes typeface and character size (Home tab → Font group).
- Bold (Ctrl+B), Italic (Ctrl+I), Underline (Ctrl+U): Emphasize text.
- Text Color & Highlighting: Home → Font Color / Text Highlight Color.
- Alignment: Left (Ctrl+L), Center (Ctrl+E), Right (Ctrl+R), Justify (Ctrl+J).
- Paragraph Spacing: Controls space before/after paragraphs.
- Line Spacing: Single, 1.5x, Double, or custom (Ctrl+1, Ctrl+5, Ctrl+2).

5.3.2 Tables in MS Word

Tables organize data in rows and columns. Insert → Table → Select rows/columns. Key table operations: merge cells, split cells, add/delete rows & columns, apply table styles, set borders & shading.

5.3.3 Mail Merge

Mail Merge creates personalized copies of a document (letters, labels, envelopes) by combining a main document with a data source (Excel spreadsheet, Access database, or Word table). It is widely used for bulk correspondence.

- Main Document: The letter template with placeholders.
- Data Source: List of recipients with their details.
- Merge Fields: Placeholders like <<Name>>, <<Address>> that get replaced.

5.4 Procedure – Part A: Text Formatting

57. Open MS Word. Type a paragraph of at least 5 sentences.
58. Select the title and apply: Bold, Font Size 16, Center Alignment.
59. Select body text and apply: Font = Times New Roman, Size = 12, Justify.
60. Change font color of the first line to Dark Blue.
61. Apply 1.5 line spacing to the entire document.
62. Add a border to the title paragraph using Format → Paragraph Borders.

5.5 Procedure – Part B: Creating a Table

63. Click Insert → Table → Insert Table (5 columns × 6 rows).
64. Enter headings: Roll No., Name, Subject 1, Subject 2, Total.
65. Fill in data for 5 students.
66. Apply a table style from Table Design tab.
67. Merge the header row cells across the top and type "Student Marks Table".
68. Add borders and shading to alternate rows.

5.6 Procedure – Part C: Mail Merge

69. Create a letter template in Word with placeholders: "Dear <<FirstName>>,"
70. Go to Mailings → Start Mail Merge → Letters.
71. Click Select Recipients → Type a New List. Add 5 recipients with Name, Address, City.
72. Insert Merge Fields at appropriate places in the letter.
73. Click Preview Results to verify the merge.
74. Click Finish & Merge → Print Documents or Edit Individual Documents.
75. Save the merged document.

5.7 Conclusion

Students learned text formatting, table creation, and the Mail Merge process in MS Word. These skills enhance document creation efficiency for professional and academic purposes.

5.8 Review Questions

76. What is the difference between Bold and Italic formatting? When is each used?
77. How do you merge cells in a Word table?
78. Define Mail Merge. List its three main components.
79. What is the keyboard shortcut for Justify alignment?
80. Name any three data sources that can be used for Mail Merge.

Practical 6: MS Word – Headers, Footers, Page Layout & Printing

Practical No.	6
Title	MS Word: Headers, Footers, Page Layout & Printing
Duration	2 Hours
Subject	Computer Fundamentals & IT

6.1 Aim

To learn to insert headers, footers, manage page layout settings, and print documents using Microsoft Word.

6.2 Objectives

- Insert and customize Headers and Footers.
- Configure page margins, orientation, and paper size.
- Use Print Preview and adjust print settings.
- Insert page numbers and watermarks.

6.3 Theory

6.3.1 Headers and Footers

Headers appear at the top margin of every page; footers at the bottom. They are used for document titles, page numbers, dates, and company names. Access via Insert → Header/Footer.

- Different First Page: Allows unique header/footer on the first page.
- Link to Previous: Links header/footer to the previous section.
- Page Numbers: Insert → Page Number (Top, Bottom, or Margin of page).

6.3.2 Page Layout

- Margins: Layout → Margins → Normal (1"), Narrow (0.5"), Wide, or Custom.
- Orientation: Portrait (vertical) or Landscape (horizontal). Layout → Orientation.
- Paper Size: A4, Letter, Legal, etc. Layout → Size.
- Columns: Divide text into 2 or 3 columns (Layout → Columns).
- Page Break: Force text to start on a new page (Ctrl + Enter or Insert → Page Break).
- Watermark: Design → Watermark → Confidential / Draft / Custom text.

6.3.3 Print Settings

- Print Preview: File → Print (shows how document looks when printed).
- Number of Copies: Set before printing.
- Print Range: All pages, current page, or custom range (e.g., 2-5).

- Duplex Printing: Print on both sides (if printer supports it).
- Print to PDF: Save as PDF instead of printing on paper.

6.4 Procedure

81. Open a multi-page document in MS Word.
82. Go to Insert → Header → Edit Header. Type "Computer Lab Manual" and date.
83. Go to Insert → Footer → Edit Footer.
84. In the footer, insert automatic page numbers (Insert → Page Number → Bottom of Page).
85. Go to Layout → Margins → Custom Margins. Set 1.25" on all sides.
86. Change orientation to Landscape and back to Portrait.
87. Go to Design → Watermark → Draft. Observe the watermark.
88. Go to File → Print. Set to print Page Range 1–2. Click Print.
89. Use Save As → PDF to export the document as a PDF file.

6.5 Important Settings Reference

Setting	Location	Common Options
Margins	Layout → Margins	Normal, Narrow, Wide, Custom
Orientation	Layout → Orientation	Portrait, Landscape
Paper Size	Layout → Size	A4, Letter, Legal
Header/Footer	Insert → Header/Footer	Built-in or Custom
Watermark	Design → Watermark	Confidential, Draft, Custom
Page Numbers	Insert → Page Number	Top, Bottom, Margin

6.6 Conclusion

Students successfully added headers, footers, page numbers, watermarks, and configured print settings in MS Word. These features are essential for creating professional, publication-ready documents.

6.7 Review Questions

90. What is the difference between a header and a footer?
91. How do you insert page numbers that start from page 2?
92. What is the use of a watermark in a document?
93. How do you print only pages 3 to 7 of a document?
94. What is the difference between Portrait and Landscape orientation?

Practical 7: MS Excel – Data Entry, Formulas & Functions

Practical No.	7
Title	MS Excel: Data Entry, Formulas & Functions
Duration	3 Hours
Subject	Computer Fundamentals & IT

7.1 Aim

To learn data entry techniques, apply mathematical formulas, and use built-in functions in Microsoft Excel.

7.2 Objectives

- Understand the Excel interface: workbook, worksheet, cells, rows, columns.
- Enter and format data in Excel cells.
- Create formulas for arithmetic calculations.
- Use common Excel functions: SUM, AVERAGE, MAX, MIN, COUNT, IF.

7.3 Theory

7.3.1 Excel Interface

- Workbook: The Excel file (.xlsx) containing one or more worksheets.
- Worksheet: A single sheet (grid of rows and columns).
- Cell: Intersection of a row and column (e.g., A1, B3).
- Formula Bar: Displays the content or formula of the active cell.
- Name Box: Shows the address of the active cell.
- Ribbon: Contains tabs: Home, Insert, Formulas, Data, Review, View.

7.3.2 Formulas & Functions

Formulas begin with "=" sign. They perform calculations on cell values. Functions are predefined formulas.

Function	Syntax	Description
SUM	=SUM(A1:A10)	Adds all values in range
AVERAGE	=AVERAGE(B1:B10)	Calculates mean
MAX	=MAX(C1:C10)	Returns largest value
MIN	=MIN(D1:D10)	Returns smallest value
COUNT	=COUNT(A1:A10)	Counts numeric cells

COUNTA	=COUNTA(A1:A10)	Counts non-empty cells
IF	=IF(A1>50,"Pass","Fail")	Conditional logic
VLOOKUP	=VLOOKUP(val,table,col,0)	Vertical table lookup
CONCATENATE	=CONCATENATE(A1," ",B1)	Joins text strings
TODAY	=TODAY()	Returns current date

7.3.3 Cell Referencing

- Relative Reference (A1): Changes when formula is copied.
- Absolute Reference (\$A\$1): Does not change when copied. Use \$ to lock.
- Mixed Reference (A\$1 or \$A1): Locks only row or only column.

7.4 Procedure

95. Open MS Excel. Create a new workbook.
96. In Sheet1, enter a "Student Marks" table with columns: Roll No., Name, English, Maths, Science.
97. Enter data for 10 students.
98. In column F (Total), enter formula: =SUM(C2:E2) and fill down.
99. In column G (Average), enter: =AVERAGE(C2:E2) and fill down.
100. In column H (Result), enter: =IF(G2>=35,"Pass","Fail") and fill down.
101. Calculate class total in a separate row using: =SUM(F2:F11).
102. Find highest marks: =MAX(G2:G11), Lowest: =MIN(G2:G11).
103. Format the table with borders and header shading.
104. Save the file as "StudentMarks.xlsx".

7.5 Conclusion

Students successfully performed data entry, applied formulas, and used Excel functions to analyze student marks data. Excel's formula capabilities make it a powerful tool for data analysis and reporting.

7.6 Review Questions

105. What is the difference between a formula and a function in Excel?
106. What is the difference between absolute and relative cell referencing?
107. Write the formula to calculate the average of cells B2 to B20.
108. How does the IF function work? Give an example.
109. What is VLOOKUP? Where is it used?

Practical 8: MS Excel – Charts, Graphs & Data Formatting

Practical No.	8
Title	MS Excel: Charts, Graphs & Data Formatting
Duration	2 Hours
Subject	Computer Fundamentals & IT

8.1 Aim

To create charts and graphs in MS Excel and apply data formatting techniques for better data visualization.

8.2 Objectives

- Create various types of charts: Bar, Column, Pie, Line.
- Customize charts with titles, labels, and legends.
- Apply Conditional Formatting to highlight data.
- Format cells with number formats, borders, and colors.

8.3 Theory

8.3.1 Charts in Excel

Charts (graphs) provide a visual representation of numerical data, making it easier to understand trends, comparisons, and patterns. Steps to create: Select data → Insert → Charts → Choose chart type.

Chart Type	Best Used For	Example Use
Column/Bar Chart	Comparing categories	Sales by department
Line Chart	Trends over time	Monthly temperature
Pie Chart	Parts of a whole (%)	Market share analysis
Area Chart	Volume over time	Website traffic
Scatter Plot	Correlation between variables	Height vs Weight

8.3.2 Conditional Formatting

Conditional Formatting automatically applies formatting (color, icon, data bar) to cells based on their values. Home → Conditional Formatting → Highlight Cell Rules / Color Scales / Data Bars / Icon Sets.

8.3.3 Data Formatting

- Number Formats: Currency, Percentage, Date, Time, Scientific (Ctrl+1 → Number tab).
- Cell Borders & Colors: Home → Font group → Borders / Fill Color.
- Merge & Center: Combines selected cells and centers the content.

- Wrap Text: Allows text to appear on multiple lines within a cell.
- Freeze Panes: View → Freeze Panes → Keeps rows/columns visible while scrolling.

8.4 Procedure

110. Open the StudentMarks.xlsx file from Practical 7.
111. Select the Name and Total columns (Ctrl+Click for non-contiguous).
112. Go to Insert → Charts → Column Chart. A chart is inserted.
113. Add a chart title: "Student Performance — Total Marks".
114. Add data labels by right-clicking chart → Add Data Labels.
115. Change the chart style using Chart Design tab.
116. Create a Pie Chart showing the percentage contribution of each subject.
117. Apply Conditional Formatting: Select marks range → Home → Conditional Formatting → Color Scales.
118. Apply a Data Bar to Total column.
119. Format the Total column as Number with 2 decimal places.
120. Apply currency format to a new "Fee" column.
121. Save the file.

8.5 Conclusion

Students successfully created and customized charts in MS Excel and applied conditional formatting and number formats. Visual data representation through charts enhances communication of information.

8.6 Review Questions

122. What is the difference between a Column chart and a Bar chart?
123. When is a Pie chart most appropriate?
124. What is Conditional Formatting? Give two practical uses.
125. How do you freeze rows in Excel so they are always visible?
126. What does "Wrap Text" do in Excel?

Practical 9: MS PowerPoint – Slide Design & Presentation

Practical No.	9
Title	MS PowerPoint: Slide Design & Presentation
Duration	2 Hours
Subject	Computer Fundamentals & IT

9.1 Aim

To create a professional presentation using Microsoft PowerPoint with slide design, animations, and transitions.

9.2 Objectives

- Create and manage slides in PowerPoint.
- Apply themes, backgrounds, and slide layouts.
- Insert text, images, SmartArt, and shapes.
- Apply animations and slide transitions.
- Set up and run a slideshow presentation.

9.3 Theory

9.3.1 PowerPoint Interface

- Slides Panel: Left side — shows thumbnail view of all slides.
- Editing Area: Central area where slide content is edited.
- Notes Panel: Below editing area for speaker notes.
- Ribbon Tabs: Home, Insert, Design, Transitions, Animations, Slide Show, Review.
- Status Bar: Bottom — shows slide count, view options, zoom.

9.3.2 Slide Layouts & Themes

- Layouts: Predefined arrangements of content placeholders (Title, Content, Blank, etc.).
- Themes: Pre-designed color schemes and fonts. Design tab → Themes.
- Slide Master: Controls formatting of all slides. View → Slide Master.
- Background: Design → Format Background (color, gradient, picture).

9.3.3 Animations & Transitions

- Transitions: Visual effects when moving between slides (Fade, Wipe, Push, etc.).
- Animations: Effects applied to individual objects on a slide (Appear, Fly In, Zoom).
- Animation Pane: Shows order and timing of all animations on the slide.
- Trigger: Animation starts on click, after previous, or with previous.

9.4 Procedure

127. Open MS PowerPoint. Select a blank presentation.
128. Go to Design → Themes → Select "Office Theme" or any preferred theme.
129. Slide 1: Title Layout — Type "Computer Fundamentals Lab Manual" as title.
130. Slide 2: Insert "Our Lab Rules" with 5 bullet points using Content layout.
131. Slide 3: Insert a SmartArt diagram (Insert → SmartArt → Process).
132. Slide 4: Insert an image from Insert → Pictures → This Device.
133. Slide 5: Create a "Thank You" slide with centered text.
134. Apply Transitions: Transitions tab → Fade to all slides.
135. Animate the title on Slide 1: Animations → Appear.
136. Animate bullet points with "Fly In" effect.
137. Set Slide Show → Set Up Show → configure timings.
138. Run the presentation using F5 (or Slide Show tab → From Beginning).
139. Save as .pptx and also Save As → PDF.

9.5 Presentation Tips

- Follow the 6×6 rule: No more than 6 bullet points, 6 words each.
- Use high-contrast colors for readability.
- Maintain consistent font style throughout.
- Use images, diagrams, and charts to support content.
- Practice the presentation before the actual delivery.
- Keep the audience engaged — speak to them, not to the screen.

9.6 Conclusion

Students successfully created a multi-slide PowerPoint presentation with themes, animations, and transitions. Effective presentation skills are crucial for academic and professional communication.

9.7 Review Questions

140. What is the difference between an Animation and a Transition in PowerPoint?
141. What is a Slide Master? Why is it useful?
142. What is the 6×6 rule for presentations?
143. How do you run a presentation from a specific slide?
144. Name four types of SmartArt graphics available in PowerPoint.

Practical 10: Internet Basics – Browser, Search & Email

Practical No.	10
Title	Internet Basics: Browser, Search & Email
Duration	2 Hours
Subject	Computer Fundamentals & IT

10.1 Aim

To understand the basics of the Internet, use a web browser effectively, perform web searches, and manage email communication.

10.2 Objectives

- Understand what the Internet is and how it works.
- Navigate websites using a web browser.
- Use effective search techniques on Google and other engines.
- Send, receive, and manage emails using a webmail client.

10.3 Theory

10.3.1 Internet & WWW

- Internet: A global network of interconnected computers that communicate using TCP/IP protocol.
- WWW (World Wide Web): A system of interlinked web pages accessed via the Internet.
- ISP (Internet Service Provider): Company that provides Internet access (e.g., Jio, Airtel, BSNL).
- URL (Uniform Resource Locator): Web address of a resource (e.g., <https://www.google.com>).
- HTTP/HTTPS: Protocol for transferring web pages. HTTPS is secure (encrypted).

10.3.2 Web Browsers

A web browser is software that retrieves and displays web pages. Popular browsers: Google Chrome, Mozilla Firefox, Microsoft Edge, Safari, Opera.

- Address Bar: Enter URL to navigate to a website.
- Tabs: Open multiple websites in one window.
- Bookmarks: Save frequently visited websites.
- History: Record of visited pages.
- Downloads: Manage downloaded files.
- Extensions/Plugins: Add extra features to the browser.

10.3.3 Effective Web Searching

- Use specific keywords rather than full sentences.
- Use quotes (" ") for exact phrase search.
- Use "site:" to search within a specific website.
- Use "filetype:pdf" to search for specific file types.
- Use "-" to exclude a word from results.
- Use Google Scholar for academic research.

10.3.4 Email Communication

- Email Address: username@domain.com format.
- Compose: Write new email; Recipients: To, CC, BCC.
- Attach Files: Paper clip icon; max size limit applies.
- Inbox/Spam/Sent/Drafts/Trash: Main email folders.
- Reply, Reply All, Forward: Respond or share emails.
- Email Etiquette: Use proper subject, salutation, and signature.

10.4 Procedure

145. Open Google Chrome. Type "www.google.com" in the address bar.
146. Search for "Computer Fundamentals" and note the number of results.
147. Refine search using: "Computer Fundamentals" filetype:pdf
148. Open 3 results in separate tabs. Bookmark the most useful one.
149. Navigate to Gmail (www.gmail.com). Sign in with your account.
150. Compose an email to your instructor with Subject: "Lab 10 Submission". Attach a file.
151. Send the email and verify it appears in Sent folder.
152. Check the Spam folder and mark a legitimate email as "Not Spam".
153. Create a new label/folder for organizing emails.

10.5 Internet Safety Basics

- Always check for HTTPS before entering personal information.
- Do not click unknown links or pop-ups.
- Log out from accounts on shared computers.
- Use strong, unique passwords for online accounts.
- Avoid downloading files from untrusted websites.

10.6 Conclusion

Students understood the fundamentals of the Internet, browsed websites, used effective search techniques, and composed professional emails. Internet literacy is a critical skill in today's digital world.

10.7 Review Questions

- 154. What is the difference between the Internet and the World Wide Web?
- 155. What is HTTPS? Why is it important?
- 156. What is the difference between CC and BCC in email?
- 157. Name four popular web browsers.
- 158. How do you search for a PDF document on Google?

Practical 11: Cybersecurity – Password Safety & Safe Browsing

Practical No.	11
Title	Cybersecurity: Password Safety & Safe Browsing
Duration	2 Hours
Subject	Computer Fundamentals & IT

11.1 Aim

To understand cybersecurity threats and learn best practices for password management and safe Internet browsing.

11.2 Objectives

- Understand common cyber threats: phishing, malware, ransomware.
- Create strong, secure passwords.
- Recognize phishing attempts and unsafe websites.
- Practice safe browsing habits and privacy protection.

11.3 Theory

11.3.1 Common Cyber Threats

Threat	Description	Prevention
Phishing	Fake emails/sites to steal credentials	Verify sender; never click unknown links
Malware	Malicious software damaging systems	Use antivirus; avoid untrusted downloads
Ransomware	Encrypts files and demands ransom	Regular backups; patch OS promptly
Spyware	Secretly collects user data	Use anti-spyware; check app permissions
Keylogger	Records keyboard input to steal data	Virtual keyboard for sensitive input
Social Engineering	Manipulating users to reveal info	Awareness training; verify requests

11.3.2 Password Security

- Minimum 12 characters combining uppercase, lowercase, numbers, and symbols.
- Avoid using personal info: name, DOB, mobile number.
- Use unique passwords for different accounts.
- Use a Password Manager (e.g., Bitwarden, LastPass) to store passwords.

- Enable Two-Factor Authentication (2FA) wherever possible.
- Change passwords periodically and immediately after a suspected breach.

11.3.3 Safe Browsing Practices

- Only visit websites with HTTPS (look for padlock icon in address bar).
- Do not allow unknown websites to send notifications.
- Clear browser cookies and cache regularly.
- Use Incognito/Private mode for sensitive browsing.
- Keep browser updated to the latest version.
- Install a reputable ad-blocker extension.
- Avoid using public Wi-Fi for banking or sensitive transactions.

11.3.4 Identifying Phishing

- Sender's email domain is misspelled or unfamiliar.
- Message creates urgency: "Your account will be blocked!"
- Links in the email do not match the displayed text.
- Grammar errors and unprofessional language.
- Requests for OTP, password, or banking details via email.

11.4 Procedure

159. Open the browser and visit HavelBeenPwned.com to check if an email was in a breach.
160. Analyze password strength at passwordmeter.com.
161. Create three sample passwords — weak, medium, and strong — and compare scores.
162. Identify phishing red flags in sample emails provided by the instructor.
163. In browser settings, enable "Safe Browsing" / "Enhanced Protection" mode.
164. Review and clear browser history, cookies, and cache.
165. Enable 2FA on a demo email account using an authenticator app.
166. Install uBlock Origin extension and test ad-blocking.

11.5 Conclusion

Students gained awareness of common cybersecurity threats and learned practical strategies for password safety and safe browsing. Cybersecurity knowledge is essential to protect personal and organizational data in the digital age.

11.6 Review Questions

167. What is phishing? How can you identify a phishing email?
168. What makes a password "strong"? Give one example.

- 169. What is Two-Factor Authentication (2FA)? Why is it important?
- 170. What does HTTPS indicate about a website?
- 171. What precautions should you take when using public Wi-Fi?

Practical 12: Introduction to Networking – LAN, WAN & IP Address

Practical No.	12
Title	Introduction to Networking: LAN, WAN, IP Address
Duration	2 Hours
Subject	Computer Fundamentals & IT

12.1 Aim

To understand the fundamentals of computer networking, types of networks, and IP addressing.

12.2 Objectives

- Define a computer network and explain its advantages.
- Differentiate between LAN, MAN, and WAN.
- Understand IP addressing (IPv4 and IPv6).
- Identify basic networking devices: Router, Switch, Hub, Modem.

12.3 Theory

12.3.1 What is a Network?

A computer network is a group of interconnected computers and devices that share resources and data. Networks allow communication, resource sharing (printers, internet), file sharing, and centralized management.

12.3.2 Types of Networks

Type	Full Form	Coverage	Example
LAN	Local Area Network	Building / Campus (up to 1 km)	Office or school network
MAN	Metropolitan Area Network	City-wide (up to 100 km)	Cable TV network in a city
WAN	Wide Area Network	Country / Global	Internet, BSNL network
PAN	Personal Area Network	Person / Room (up to 10 m)	Bluetooth devices
VPN	Virtual Private Network	Logical, over internet	Remote office access

12.3.3 IP Addressing

An IP (Internet Protocol) address is a unique numerical label assigned to each device on a network. It identifies the device and enables routing of data.

- IPv4: 32-bit address in dotted decimal notation. Example: 192.168.1.100. Supports ~4.3 billion addresses.
- IPv6: 128-bit address in hexadecimal. Example: 2001:0db8:85a3::8a2e:0370:7334. Supports virtually unlimited addresses.
- Private IP: Used within LAN (e.g., 192.168.x.x, 10.x.x.x). Not routed on the internet.
- Public IP: Assigned by ISP; used to communicate on the internet.
- Subnet Mask: Defines the network portion of an IP address (e.g., 255.255.255.0).
- Default Gateway: IP address of the router (connects local network to internet).
- DNS (Domain Name System): Translates domain names to IP addresses.

12.3.4 Networking Devices

- Hub: Broadcasts data to all devices (obsolete, replaced by switches).
- Switch: Sends data only to the destination device in a LAN.
- Router: Connects different networks; routes data between LAN and WAN.
- Modem: Converts digital signals to analog (and back) for internet access.
- Access Point (AP): Provides Wi-Fi connectivity to wireless devices.
- Firewall: Monitors and controls incoming/outgoing network traffic.

12.4 Procedure

172. Open Command Prompt (Windows key + R → cmd → Enter).
173. Type "ipconfig" and note: IP address, Subnet mask, Default gateway, DNS.
174. Type "ping 8.8.8.8" to test internet connectivity.
175. Type "ping www.google.com" to test DNS resolution.
176. Type "tracert www.google.com" to trace the route to Google's server.
177. Type "netstat" to view active network connections.
178. Go to Control Panel → Network and Internet → Network Connections and identify adapters.
179. Draw a simple LAN diagram showing 5 computers connected to a switch and router.

12.5 Useful Networking Commands

Command	Purpose
ipconfig	Show IP configuration of all network adapters
ipconfig /all	Show detailed network configuration
ping <address>	Test connectivity to a host
tracert <address>	Trace the path to a destination
netstat	Show active connections and open ports

nslookup <domain>	Find IP of a domain name
arp -a	Show ARP table (IP to MAC mapping)

12.6 Conclusion

Students understood types of networks, IP addressing concepts, and basic networking devices. They used command-line tools to inspect network settings and connectivity. Networking is the backbone of modern IT infrastructure.

12.7 Review Questions

180. What is the difference between LAN and WAN? Give one real-life example of each.
181. What is an IP address? Differentiate between IPv4 and IPv6.
182. What is the difference between a Switch and a Hub?
183. What command is used to check your IP address in Windows?
184. What is a DNS server? Why is it important?

Practical 13: Input/Output Devices – Setup & Troubleshooting

Practical No.	13
Title	Input/Output Devices: Setup & Troubleshooting
Duration	2 Hours
Subject	Computer Fundamentals & IT

13.1 Aim

To set up and troubleshoot common input and output devices connected to a computer system.

13.2 Objectives

- Install and configure input devices: keyboard, mouse, scanner, webcam.
- Set up output devices: monitor, printer, speaker.
- Diagnose and resolve common hardware issues.
- Use Device Manager to manage hardware drivers.

13.3 Theory

13.3.1 Device Manager

Device Manager is a Windows utility that allows users to view and manage hardware devices. Access via: Right-click This PC → Properties → Device Manager or type "devmgmt.msc" in Run dialog.

- Yellow (!) icon: Driver issue or conflict.
- Red (X) icon: Device is disabled.
- No icon: Device is working normally.
- Actions: Update driver, Uninstall device, Disable/Enable, Scan for hardware changes.

13.3.2 Common Input Device Issues

Device	Problem	Solution
Keyboard	Keys not responding	Reconnect; update driver; check Device Manager
Mouse	Cursor not moving	Clean optical sensor; reconnect; try different port
Scanner	Not detected	Install scanner software/driver; restart
Webcam	No video feed	Check privacy settings; update driver
Monitor	No display	Check VGA/HDMI cable; verify power; try other port

Printer	Prints blank pages	Check ink/toner; run print head cleaning
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13.3.3 Printer Setup

- Connect printer via USB or Wi-Fi to the computer.
- Install printer driver from the manufacturer's CD or website.
- Go to Settings → Devices → Printers & Scanners → Add a printer.
- Set the printer as Default Printer.
- Print a Test Page: Printers & Scanners → Printer Properties → Print Test Page.

13.3.4 Monitor Configuration

- Right-click Desktop → Display Settings.
- Adjust Resolution (recommended: 1920×1080 for Full HD).
- Set Refresh Rate (Display Settings → Advanced display settings).
- Adjust Brightness, Contrast using monitor's physical buttons or Settings.
- Arrange multiple monitors in Display Settings.

13.4 Procedure

185. Connect a keyboard and mouse to the computer. Verify they work.
186. Open Device Manager and locate all input/output devices.
187. Identify any device with a warning (!) or error (X) icon.
188. Right-click the problem device → Update Driver → Search automatically.
189. Connect a printer (or use the lab printer). Install drivers.
190. Go to Settings → Printers & Scanners and print a test page.
191. Adjust monitor resolution to 1920×1080 using Display Settings.
192. If a device is not recognized, try connecting to a different USB port.
193. Document all findings in the observation table.

13.5 Observations

Device	Status in Device Mgr.	Issue Found	Solution Applied
Keyboard			
Mouse			
Printer			
Monitor			
Webcam			

13.6 Conclusion

Students successfully set up and troubleshoot common input/output devices. Knowledge of Device Manager, driver management, and hardware configuration is fundamental for IT support professionals.

13.7 Review Questions

194. What is Device Manager? How do you access it in Windows?
195. What does a yellow (!) icon next to a device in Device Manager indicate?
196. List the steps to install a new printer in Windows.
197. What is the recommended screen resolution for a Full HD monitor?
198. What should you do if a USB device is not recognized?

Practical 14: Antivirus, Software Installation & System Maintenance

Practical No.	14
Title	Antivirus, Software Installation & System Maintenance
Duration	2 Hours
Subject	Computer Fundamentals & IT

14.1 Aim

To learn how to install software, manage antivirus protection, and perform routine system maintenance tasks in Windows.

14.2 Objectives

- Install and uninstall software correctly.
- Configure and run antivirus scans.
- Perform disk cleanup and defragmentation.
- Use Windows Update and System Restore.

14.3 Theory

14.3.1 Software Installation

Installing software involves downloading the installer (setup file) and following the wizard. Key steps: Accept License Agreement → Choose install location → Configure options → Finish.

- Always download from official websites to avoid malware.
- Run installer as Administrator (Right-click → Run as Administrator).
- Check system requirements before installing.
- Uninstall via: Settings → Apps → Select app → Uninstall.

14.3.2 Antivirus Software

Antivirus software protects the system from malware, viruses, ransomware, and spyware. Key features include real-time protection, scheduled scans, quarantine, and firewall integration.

Antivirus	Type	Known For
Windows Defender	Built-in (Free)	Good baseline protection
Avast	Free/Paid	Lightweight, wide coverage
Kaspersky	Paid	High detection rates
Malwarebytes	Free/Paid	Excellent for malware removal
Bitdefender	Paid	Top-ranked performance

14.3.3 System Maintenance Tasks

- Disk Cleanup: Removes temporary files, old Windows files. (Search: Disk Cleanup).
- Defragmentation: Reorganizes fragmented data on HDD. (Not needed for SSD). Search: Defragment and Optimize Drives.
- Windows Update: Keeps OS secure and up-to-date. Settings → Windows Update → Check for updates.
- Task Manager: Monitor CPU, RAM, Disk, Network usage. (Ctrl+Shift+Esc).
- System Restore: Restores computer to a previous healthy state. (Search: Create a restore point).
- Startup Programs: Disable unnecessary startup programs. (Task Manager → Startup tab).
- Temp File Cleanup: Run: %temp% in Run dialog → Delete all temp files.

14.4 Procedure

199. Open Windows Defender (Search: Windows Security). Review protection status.
200. Run a Quick Scan and note the results.
201. Schedule a Full Scan for off-hours (Virus & threat protection → Manage settings).
202. Open Settings → Apps. View all installed programs.
203. Install a free utility (e.g., VLC Media Player) from the official website.
204. Verify installation and then uninstall it from Apps & Features.
205. Search "Disk Cleanup" and run it on C: drive. Note the space freed.
206. Search "Defragment and Optimize Drives". Analyze the C: drive.
207. Go to Settings → Windows Update → Check for Updates.
208. Open Task Manager (Ctrl+Shift+Esc). Note CPU, RAM, and Disk usage.
209. Go to Startup tab in Task Manager. Disable 2 unnecessary startup programs.
210. Type %temp% in Run dialog. Delete all temporary files.

14.5 Conclusion

Students learned to manage antivirus protection, install/uninstall software, and perform system maintenance tasks. Regular system maintenance ensures optimal performance, security, and longevity of a computer system.

14.6 Review Questions

211. What is the difference between a virus and malware?
212. Why is it important to keep Windows updated?
213. What is Disk Defragmentation? Is it needed for SSDs?

- 214. How do you disable startup programs in Windows?
- 215. What is System Restore and when should it be used?

Practical 15: Introduction to Artificial Intelligence (AI)

Practical No.	15
Title	Introduction to Artificial Intelligence (AI)
Duration	2 Hours
Subject	Computer Fundamentals & IT / AI Fundamentals

15.1 Aim

To introduce students to the concept of Artificial Intelligence, its types, applications, and ethical implications in modern society.

15.2 Objectives

- Define Artificial Intelligence and understand its history.
- Identify different types of AI: Narrow, General, and Super AI.
- Explore real-world applications of AI across various domains.
- Understand Machine Learning, Deep Learning, and NLP basics.
- Discuss ethical considerations and the future of AI.

15.3 Theory

15.3.1 What is Artificial Intelligence?

Artificial Intelligence (AI) is the simulation of human intelligence processes by computer systems. These processes include learning (acquiring information), reasoning (using rules to reach conclusions), and self-correction. AI was coined as a term by John McCarthy in 1956 at the Dartmouth Conference.

15.3.2 Types of Artificial Intelligence

Type	Description	Example
Narrow AI (Weak AI)	Designed for a specific task	Siri, Alexa, Chess engine, Face recognition
General AI (Strong AI)	Performs any intellectual task like a human (theoretical)	Not yet achieved
Super AI	Surpasses human intelligence in all domains (hypothetical)	Theoretical concept only
Reactive Machines	No memory; reacts to current input	Deep Blue (Chess computer)
Limited Memory AI	Uses past data to make decisions	Self-driving cars, Chatbots
Theory of Mind AI	Understands human emotions (research stage)	Ongoing research

15.3.3 Key Branches of AI

- **Machine Learning (ML):** AI systems that learn from data without being explicitly programmed. Types: Supervised, Unsupervised, Reinforcement Learning.
- **Deep Learning:** A subset of ML using multi-layered neural networks inspired by the human brain. Used in image recognition, speech recognition, and NLP.
- **Natural Language Processing (NLP):** Enables computers to understand, interpret, and generate human language. Examples: Google Translate, ChatGPT, Siri.
- **Computer Vision:** Enables machines to interpret visual data (images, videos). Used in facial recognition, medical imaging, autonomous vehicles.
- **Robotics:** Integration of AI with mechanical systems for automation. Examples: surgical robots, industrial automation, drones.
- **Expert Systems:** AI programs that simulate the decision-making of a human expert. Used in medical diagnosis and financial planning.

15.3.4 AI in Everyday Life

Domain	AI Application
Healthcare	Disease diagnosis, drug discovery, personalized medicine, robotic surgery
Education	Personalized learning, chatbot tutors, automated grading, adaptive tests
Finance	Fraud detection, algorithmic trading, credit scoring, chatbots
Transportation	Self-driving cars, route optimization, traffic management
Entertainment	Netflix/YouTube recommendations, game AI, deepfake detection
Agriculture	Crop monitoring, pest detection, automated irrigation
Cybersecurity	Threat detection, anomaly detection, spam filtering
Retail	Product recommendations, inventory management, chatbots

15.3.5 How Machine Learning Works

Machine Learning (ML) is the most widely implemented branch of AI. The process involves:

216. **Data Collection:** Gather relevant training data.
217. **Data Preprocessing:** Clean, normalize, and prepare data.
218. **Model Selection:** Choose an appropriate algorithm.
219. **Training:** Feed data to the model to learn patterns.
220. **Evaluation:** Test model accuracy on unseen data.
221. **Deployment:** Integrate the trained model into applications.
222. **Feedback Loop:** Continuously improve the model with new data.

15.3.6 Ethical Considerations in AI

- **Bias & Fairness:** AI models can inherit biases from training data, leading to unfair decisions.

- Privacy: AI systems collecting personal data raise significant privacy concerns.
- Job Displacement: Automation may replace certain human jobs.
- Transparency (Explainability): "Black-box" AI decisions can be difficult to explain or audit.
- Security: AI systems can be adversarially attacked or manipulated.
- Accountability: Determining responsibility when AI systems cause harm.
- Autonomy: Ensuring humans retain meaningful control over AI decisions.

15.4 Procedure

223. Open a browser and visit Google AI (ai.google) or OpenAI (openai.com).
224. Explore an AI demo: try Google Teachable Machine (teachablemachine.withgoogle.com).
225. Train a simple image classification model using your webcam (e.g., recognize thumbs up/down).
226. Test the trained model and observe predictions.
227. Visit ChatGPT (chat.openai.com) or similar chatbot. Ask 5 different questions.
228. Try Google Translate to translate a sentence from English to Hindi and back.
229. Visit [Quickdraw.withgoogle.com](https://quickdraw.withgoogle.com) and interact with the AI drawing game.
230. Discuss with the class: which applications of AI you use daily without knowing.
231. Fill in the observation table with findings.

15.5 Observations

AI Tool Explored	Task Performed	Observation / Result
Google Teachable Machine		
AI Chatbot		
Google Translate		
Quick Draw		
AI Recommendation		

15.5.1 AI Tools for Students

- ChatGPT / Claude: Conversational AI for writing, coding, and learning.
- Grammarly: AI-powered writing assistant.
- Khan Academy Khanmigo: AI tutor for personalized learning.
- Google Lens: Visual search and translation using AI.
- Canva AI: AI-powered design tools.
- Otter.ai: Automatic transcription of lectures and meetings.

15.6 Future of AI

The future of AI holds extraordinary promise. Key trends include: Generative AI (text, image, video creation), AI in personalized medicine, autonomous vehicles, AI governance and regulation, AI at the edge (on-device AI), and human-AI collaboration in the workplace. Responsible and ethical AI development is crucial to ensure technology benefits all of humanity.

15.7 Conclusion

Students gained a foundational understanding of Artificial Intelligence, its types, branches, and real-world applications. AI is transforming every industry and developing literacy in AI is becoming as essential as reading and writing in the 21st century. Students should continue exploring AI tools and stay informed about ethical developments in the field.

15.8 Review Questions

232. Define Artificial Intelligence. Who coined the term and when?
233. What is the difference between Narrow AI and General AI?
234. Explain Machine Learning in your own words. What are its three types?
235. What is Natural Language Processing (NLP)? Give two real-life examples.
236. List any five applications of AI in everyday life.
237. What are the ethical concerns associated with AI development?
238. What is Deep Learning? How is it related to Machine Learning?
239. What AI tools have you used? What tasks did they help you with?