SHREE DEVI INSTITUTE OF TECHNOLOGY

Kenjar Mangalore

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

TECHNICAL WRITING USING LATEX MANUAL BCSL456D

LIST OF EXPERIMENTS

1	Develop a LaTeX script to create a simple document that consists of 2 sections [Section1, Section2], and a paragraph with dummy text in each section. And also include header [title of document] and footer [institute name, page number] in the document.
2	Develop a LaTeX script to create a document that displays the sample Abstract/Summary.
3	Develop a LaTeX script to create a simple title page of the VTU project Report [Use suitable Logos and text formatting]
4	Develop a LaTeX script to create the Certificate Page of the Report [Use suitable commands to leave the blank spaces for user entry]
5	Develop a LaTeX script to create a document that contains the following table with proper labels.
6	Develop a LaTeX script to include the side-by-side graphics/pictures/figures in the document by using the subgraph concept.
7	Develop a LaTeX script to create a document that consists of the following two mathematical equations.
8	Develop a LaTeX script to demonstrate the presentation of Numbered theorems, definitions, corollaries, and lemmas in the document
9	Develop a LaTeX script to create a document that consists of two paragraphs with a minimum

Table within experiment 5:

S.No	USN	Student Name	Marks		
			Subject1	Subject2	Subject3
1	4XX22XX001	Name 1	89	60	90
2	4XX22XX002	Name 2	78	45	98
3	4XX22XX003	Name 3	67	55	59

Equations within experiment 7:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$= \frac{-2 \pm \sqrt{2^2 - 4*(1)*(-8)}}{2*1}$$

$$= \frac{-2 \pm \sqrt{4+32}}{2}$$

$$\varphi_\sigma^\lambda A_t = \sum_{\pi \in C_t} \mathrm{sgn}(\pi) \varphi_\sigma^\lambda \varphi_\pi^\lambda$$

$$= \sum_{\tau \in C_{\sigma t}} \mathrm{sgn}(\sigma^{-1}\tau\sigma) \varphi_\sigma^\lambda \varphi_{\sigma^{-1}\tau\sigma}^\lambda$$

$$= A_{\sigma t} \varphi_\sigma^\lambda$$

	of 10 citations in it and display the reference in the section	
10	Develop a LaTeX script to design a simple tree diagram or hierarchical structure in the document with appropriate labels using the Tikz library	
11	Develop a LaTeX script to present an algorithm in the document using algorithm/algorithmic/algorithm2e library	
12	Develop a LaTeX script to create a simple report and article by using suitable commands and formats of user choice.	

1. **Develop a LaTeX script to create a simple document that consists of 2 sections [Section1, Section2], and a paragraph with dummy text in each section. And also include header [title of document] and footer [institute name, page number] in the document.**

```
\documentclass{article}
% Packages for formatting
\usepackage{fancyhdr} % For custom headers and footers
\pagestyle{fancy}
\fancyhf{}
\fancyhead[C]{SHREE DEVI INSTITUTE OF TECHNOLOGY}
\fancyfoot[R]{CSE}
\renewcommand{\headrulewidth}{3pt}
\renewcommand{\footrulewidth}{3pt}
\rfoot{1}
\lfoot{SDIT}
\begin{document}
\section{INTODUCTION}
Welcome to Shree Devi Institute of Technology
Shree Devi Institute of Technology, Mangalore, is famed destination for students aspiring to pursue Engineering (BE, M.Tech.), Management (MBA), Computer studies (MCA) and Research (Ph. D.). Affiliated to VTU Belgaum and recognized by AICTE New Delhi, SDIT provides excellent education in each of the fields.
\section{ABOUT US}
Our Institute's aim is to provide students with a rich and propitious learning environment so that they acquire the knowledge and skills needed for succeeding in their professional as well as personal lives. A team of dedicated faculty, a brilliant student community, excellent technical and support staff and an effective administration have all contributed to the preeminent status for Shree Devi Institute of Technology, Kenjar Mangalore.
SDIT offers opportunities to students to pursue Management (MBA), Computer studies (MCA) , Engineering (BE, M.Tech.) and Research (Ph. D.) in an ambience of natural beauty. The campus is set amidst the vibrant surroundings of suburban Mangalore. The modern buildings house excellent state-ofthe- art laboratories and instructional facilities relevant to the course of study. Well-qualified staff augments infrastructural resources for the overall benefit of the students.
\end{document}
```

2. Develop a LaTeX script to create a document that displays the sample Abstract/Summary.

```
\documentclass{article}
% Define title and author
\title{ABSTRACT}
\date{} % Remove date
\begin{document}
\maketitle
% Define title and author
\begin{document}
\maketitle
Wireless charging is a convenient method of charging Electric Vehicles (EVs). Its application
has been widely studied for electric cars but so far there have been limited experiments for electric bicycles
(e-bikes). This paper addresses the design process and implementation details related to a wireless charger for
a specific e-bike. Some issues such as the position of the secondary coil or the control algorithm prove to be
crucial to the performance of the wireless transfer. Concerning the placement of the secondary coil, the paper
proposes and validates a theoretical model to quantify the effects of the surrounding interfering materials.
A CC-CV (Constant Current - Constant Voltage) control algorithm has been implemented to validate the
theoretical results in these two charging phases. The control, the coils and the compensation networks have
been designed to be simple and robust. The theoretical model, the charger and its control have proven to be
effective in a real 84-W e-bike.
\subsection*{Keywords}
Keywords:Control, coil position, electric bicycle, wireless charger.
\end{document}
```

3. Develop a LaTeX script to create a simple title page of the VTU project Report [Use suitable Logos and text formatting].

```
\documentclass[12pt, a4paper]{report} % Document class with font size 12pt and
paper size A4
\usepackage{graphicx} % Package to include images
\usepackage{geometry} % Package to customize page layout
\geometry{a4paper, total={170mm, 257mm}, left=20mm, right=20mm, top=30mm,
bottom=30mm} % Customizing page margins
\thispagestyle{empty} % Suppressing page numbers for the title page
\begin{document}
\begin{titlepage} % Starting the title page environment
\begin{center} % Centering content
% University Details
\textbf{{\large VISVESVARAYA TECHNOLOGICAL UNIVERSITY}}\\
{\normalsize Jnana Sangama, Belgaum-590018}\\
\vspace{0.3in}
\includegraphics[scale=0.2]{vtu.png}\\
\vspace{0.3in}
% Title and Project Details
\textbf{A PROJECT REPORT} \\
ON \\
\vspace{0.2in}
\textbf{{\large "Create Report Format Using LaTeX"}}\\
\vspace{0.1in}
{\small Submitted in partial fulfillment of the requirements for the award of }\\
\vspace{0.1in}
\textbf{BACHELOR OF ENGINEERING\\IN\\COMPUTER SCIENCE
AND ENGINEERING}\\
\vspace{0.2in}
% Student Details
Submitted by\\
\vspace{0.0in}
\begin{tabular}{ll}
\textbf{ABC} & \textbf{4SH22CS001}\\
\textbf{XYZ} & \textbf{4SH22CS002}\\
\textbf{LMN} & \textbf{4SH22CS003}\\
\textbf{PQR} & \textbf{4SH22CS004}\\
\end{tabular}
\vspace{0.2in}\\
% Guide Details
\textbf{Under the Guidance of}\\
Mr/Mrs\\
Asst. Professor Department of CSE\\
\vspace{0.2in}
```

% College Details
\includegraphics[scale=0.9]{sdit.png}\\
\vspace{0.01in}
{\small DEPARTMENT OF COMPUTER SCIENCE AND
ENGINEERING}\\
\vspace{0.1in}
\textbf{SHREE DEVI INSTITUTE OF TECHNOLOGY}\\
{\small Affiliated to VTU, Belagavi, Kenjar}\\
\vspace{0.1in}
{\small 2023-2024}\\
\end{center} % Ending the center environment
\end{titlepage} % Ending the title page environment
\end{document}

4. Develop a LaTeX script to create the Certificate Page of the Report [Use suitable commands to leave the blank spaces for user entry]

```
\documentclass{article}
\usepackage{geometry}
\geometry{a4paper, margin=1in}
\usepackage{graphicx}
\usepackage{ragged2e}
\begin{document}
\vspace{1cm}
\begin{center}
\textbf{SHREE DEVI INSTITUTE OF TECHNOLOGY} \\
(Affiliated To Visvesvaraya Technological University, Belagavi) \\
MANGALURU-574142\\
\textbf{DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING}
\end{center}
\begin{center}
\includegraphics[width=0.3\textwidth]{example-image} % Add your image here
\end{center}
\vspace{1cm}
\begin{center}
\textbf{CERTIFICATE}
\end{center}
\vspace{0.5cm}
\begin{center}
\begin{minipage}{0.9\textwidth}
\justifying
Certified that the project work entitled \textbf{TECHNICAL WRITING USING LATEX}presented by \textbf{Ms/Mr}, USN \textbf{4SH22CS001}, a bonafide student of \textbf{Shree Devi Institute of Technology} in partial fulfillment for the academic requirement of IV Semester Bachelor of Engineering in Computer Science and Engineering of the Visvesvaraya Technological University, Belagavi during the year 2024. The technical seminar report has been approved as it satisfies the academic requirements with respect to technical seminar work prescribed for the Bachelor of Engineering under the above said university.
\end{minipage}
\end{center}
\vspace{1cm}
\begin{center}
\begin{minipage}[t]{0.45\textwidth}
\centering
\hrule
\vspace{0.2cm}
Signature of the Guide \\
```

(guide name)
\end{minipage}%
\hfill
\begin{minipage}[t]{0.45\textwidth}
\centering
\hrule
\vspace{0.2cm}
Signature of the HOD \\
(name of HOD)
\end{minipage}
\end{center}
\end{document}

Prog 5 : Develop a LaTeX script to create a document that contains the following table with proper labels.

S.No	USN	Student Name	Marks		
			Subject1	Subject2	Subject3
1	4XX22XX001	Name 1	89	60	90
2	4XX22XX002	Name 2	78	45	98
3	4XX22XX003	Name 3	67	55	59

\documentclass{article}

\usepackage{array}

\begin{document}

\begin{tabular}{|c|c|c|c|c|c|}

\hline

\textbf{S.No} & \textbf{USN} & \textbf{Student Name} & \multicolumn{3}{c|}{\textbf{Marks}} \\ \cline{4-6}

 & & & \textbf{Subject1} & \textbf{Subject2} & \textbf{Subject3} \\ \hline

1 & 4SH22CS001 & AKASH & 89 & 60 & 90 \\ \hline

2 & 4SH22CS002 & ANANYA & 78 & 45 & 98 \\ \hline

3 & 4SH22CS003 & AMOGH & 67 & 55 & 59 \\ \hline

\end{tabular}

\end{document}

6. Develop a LaTeX script to include the side-by-side graphics/pictures/figures in the document by using the subgraph concept.

```
\documentclass{article}
\usepackage{graphicx} % Required for including images
\usepackage{subcaption} % Required for subfigures
\begin{document}
\begin{figure}
\centering
\begin{subfigure}{0.46\linewidth} % Subfigure environment for the first image
\includegraphics[width=\linewidth]{image1.jpg} % Include image1.jpg
\caption{Caption for image 1} % Caption for the first image
\label{fig:subfig1} % Label for referencing the first image
\end{subfigure}
\hfill % Add horizontal space between subfigures
\begin{subfigure}{0.46\linewidth} % Subfigure environment for the second
\includegraphics[width=\linewidth]{image2.jpg} % Include image2.jpg
\caption{Caption for image 2} % Caption for the second image
\label{fig:subfig2} % Label for referencing the second image
\end{subfigure}
\caption{Combined caption for both images} % Overall caption for the figure
\label{fig:subfigures} % Label for referencing the entire figure
\end{figure}
\end{document}
```

7. Develop a LaTeX script to create a document that consists of the following two mathematical equations.

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$= \frac{-2 \pm \sqrt{2^2 - 4*(1)*(-8)}}{2*1}$$

$$= \frac{-2 \pm \sqrt{4+32}}{2}$$

$$\varphi_\sigma^\lambda A_t = \sum_{\pi \in C_t} \operatorname{sgn}(\pi)\varphi_\sigma^\lambda \varphi_\pi^\lambda$$

$$= \sum_{\tau \in C_{\sigma t}} \operatorname{sgn}(\sigma^{-1}\tau\sigma)\varphi_\sigma^\lambda \varphi_{\sigma^{-1}\tau\sigma}^\lambda$$

$$= A_{\sigma t}\varphi_\sigma^\lambda$$

\documentclass{article}

\usepackage{amsmath}

\begin{document}

The quadratic formula:

\begin{align*}

x &= \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \\

&= \frac{-2 \pm \sqrt{2^2 - 4(1)(-8)}}{2 \cdot 1} \\

&= \frac{-2 \pm \sqrt{4 + 32}}{2}

\end{align*}

Another mathematical expression:

\begin{align*}

\varphi^{\lambda}_{\sigma}A_{t} &= \sum_{\pi \in C_{t}} \operatorname{sgn}(\pi) \varphi^{\lambda}_{\sigma} \varphi_{\pi}^{\lambda} \\

&= \sum_{\tau \in C_{\sigma t}} \operatorname{sgn}(\sigma^{-1} \tau \sigma) \varphi^{\lambda}_{\sigma} \varphi_{\sigma^{-1} \tau \sigma}^{\lambda} \\

&= A_{\sigma t} \varphi^{\lambda}_{\sigma}

\end{align*}

\end{document}

8. Develop a LaTeX script to demonstrate the presentation of Numbered theorems, definitions, corollaries, and lemmas in the document.

```latex
\documentclass{article}
\usepackage{amsthm}
\newtheorem{theorem}{Theorem}
\newtheorem{lemma}[theorem]{Lemma}
\newtheorem{corollary}[theorem]{Corollary}
\newtheorem{definition}[theorem]{Definition}
\begin{document}
\section*{Short Example}
\begin{theorem}
(Pythagoras' Theorem) In a right-angled triangle, $a^2 + b^2 = c^2$.
\end{theorem}
\begin{definition}
A \textit{right-angled triangle} has one $90^\circ$ angle.
\end{definition}
\begin{lemma}
The hypotenuse is the longest side in a right-angled triangle.
\end{lemma}
\begin{corollary}
If a triangle is not right-angled, $a^2 + b^2 \neq c^2$.
\end{corollary}
\end{document}
```

9. Develop a LaTeX script to create a document that consists of two paragraphs with a minimum of 10 citations in it and display the reference in the section.

Pgm9.tex

```
\documentclass{article}

% Packages
\usepackage[utf8]{inputenc}
\usepackage{cite}

% Document
\begin{document}

\title{A Sample Document with Citations}
\author{Author Name}
\date{\today}
\maketitle

\section{Introduction}
This document provides a demonstration of how to include multiple citations within paragraphs. Research in various fields has shown significant findings, such as the impact of social networks on human behavior \cite{ref1, ref2}, the development of machine learning algorithms \cite{ref3, ref4, ref5}, and advancements in medical technology \cite{ref6, ref7}.

\section{Discussion}
Further studies have explored the environmental effects of industrialization \cite{ref8, ref9} and the role of policy in mitigating climate change \cite{ref10, ref11}. These studies underscore the importance of interdisciplinary approaches in addressing global challenges.

\section{References}
\bibliographystyle{plain}
\bibliography{references}

\end{document}
```

References.bib

```
@article{ref1,
    author = {Author A},
    title = {Title of the First Article},
    journal = {Journal Name},
    year = {2020},
    volume = {10},
    pages = {1-10}
}

@article{ref2,
```

```
    author = {Author B},
    title = {Title of the Second Article},
    journal = {Journal Name},
    year = {2019},
    volume = {11},
    pages = {11-20}
}

@article{ref3,
    author = {Author C},
    title = {Title of the Third Article},
    journal = {Journal Name},
    year = {2018},
    volume = {12},
    pages = {21-30}
}

@article{ref4,
    author = {Author D},
    title = {Title of the Fourth Article},
    journal = {Journal Name},
    year = {2017},
    volume = {13},
    pages = {31-40}
}

@article{ref5,
    author = {Author E},
    title = {Title of the Fifth Article},
    journal = {Journal Name},
    year = {2016},
    volume = {14},
    pages = {41-50}
}

@article{ref6,
    author = {Author F},
    title = {Title of the Sixth Article},
    journal = {Journal Name},
    year = {2015},
    volume = {15},
    pages = {51-60}
}
```

```
@article{ref7,
   author = {Author G},
   title = {Title of the Seventh Article},
   journal = {Journal Name},
   year = {2014},
   volume = {16},
   pages = {61-70}
}

@article{ref8,
   author = {Author H},
   title = {Title of the Eighth Article},
   journal = {Journal Name},
   year = {2013},
   volume = {17},
   pages = {71-80}
}

@article{ref9,
   author = {Author I},
   title = {Title of the Ninth Article},
   journal = {Journal Name},
   year = {2012},
   volume = {18},
   pages = {81-90}
}

@article{ref10,
   author = {Author J},
   title = {Title of the Tenth Article},
   journal = {Journal Name},
   year = {2011},
   volume = {19},
   pages = {91-100}
}

@article{ref11,
   author = {Author K},
   title = {Title of the Eleventh Article},
   journal = {Journal Name},
   year = {2010},
   volume = {20},
   pages = {101-110}
}
```

10. Develop a LaTeX script to design a simple tree diagram or hierarchical structure in the document with appropriate labels using the Tikz library.

```
\documentclass{article}

% Packages
\usepackage{tikz}
\usetikzlibrary{trees}

% Document
\begin{document}

\title{Simple Tree Diagram}
\author{Author Name}
\date{\today}
\maketitle

\section{Tree Diagram}

\begin{center}
\begin{tikzpicture}[
  level 1/.style={sibling distance=60mm},
  level 2/.style={sibling distance=30mm}
]

% Root
\node {Root}
 % Level 1
 child {node {Child 1}
  % Level 2
  child {node {Grandchild 1}}
  child {node {Grandchild 2}}
 }
 child {node {Child 2}
  % Level 2
  child {node {Grandchild 3}}
  child {node {Grandchild 4}}
 };

\end{tikzpicture}
\end{center}

\end{document}
```

11. Develop a LaTeX script to present an algorithm in the document using algorithm/algorithmic/algorithm2e library.

\documentclass{article}

\usepackage{algorithm}

\usepackage{algorithmic}

\begin{document}

\begin{algorithm}

\caption{Simple Algorithm using \texttt{algorithmic}}

\label{alg:algorithmic_simple}

\begin{algorithmic}

\STATE Initialize variables

\FOR{each item in the list}

\IF{condition is met}

\STATE Perform action A

\ELSE

\STATE Perform action B

\ENDIF

\ENDFOR

\STATE Return result

\end{algorithmic}

\end{algorithm}

\end{document}

11b.

\documentclass{article}

\usepackage[linesnumbered,ruled,vlined]{algorithm2e}

\begin{document}

    \begin{algorithm}

        \caption{Simple Algorithm using \texttt{algorithm2e}}

        \label{alg:algorithm2e_simple}

        Initialize variables\;

        \For{each item in the list}{

            \eIf{condition is met}{

                Perform action A\;

            }{

                Perform action B\;

            }

        }

        Return result\;

    \end{algorithm}

\end{document}

12. Develop a LaTeX script to create a simple report and article by using suitable commands and formats of user choice.

\documentclass{report}

\title{Simple Report Example}

\author{John Doe}

\date{\today}

\begin{document}

\maketitle

\tableofcontents

\chapter{Introduction}

This is the introduction chapter of the report. Here you describe the purpose and scope of the report.

\chapter{Background}

This chapter provides background information and context for the report's subject.

\chapter{Methodology}

This chapter outlines the methods and approaches used in the report.

\chapter{Conclusion}

This chapter summarizes the findings and conclusions of the report.

\end{document}