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 o

```
\documentclass{article}

\usepackage{enumitem}


\begin{document}


\section*{1 What is GMIT?}

GMIT-GM Institute of Technology offers courses in Electronics and Communication Engineering, Mechanical Engineering, Robotics Engineering, Electrical Engineering, Computer Science Engineering, Information Technology, Civil Engineering, and Biotechnology Engineering.


\section*{2 More about GMIT}

GM Institute of Technology is a well-established Hi-Tech Engineering Institute established in the academic year 2001-02, National Highway No 4, 265 Km away from Bangalore. The campus is spread over 54 acres of lush green land with well-planned monolithic buildings and state-of-the-art infrastructure.


The Institution is approved by AICTE– New Delhi and affiliated to Visvesvaraya Technological University (VTU), Belagavi with the Karnataka State Government approval. Institution also has ISO 9001:2015 certification from TUV Nord. To meet the expectations of the society, four programs, Computer Science and Engineering, Electronics and Communication Engineering, Civil Engineering and Mechanical Engineering have been accredited by NBA for the period of three years. In addition, the Institute also has NAAC Certificate for the period of 5 years. The institution also has 2(f) and 12(B) certificates for research purposes.


To bridge the gap between industry and institution, we at GMIT participate every year in the AICTE– CII survey to establish the industry interaction and are proud to inform you that the institution receives Gold rating every year.


\section*{3 Programs Offered}

It offers 9 UG Engineering Programs namely:

\begin{itemize}[noitemsep]
  \item Computer Science and Engineering
  \item Information Science and Engineering
  \item Artificial Intelligence and Machine Learning
  \item Electronics and Communication Engineering
  \item Electrical and Electronics Engineering
  \item Robotics and Automation Engineering
```

```
   \item Mechanical Engineering

   \item Civil Engineering

   \item Bio-Technology

\end{itemize}


\section*{4 Vision}

Free software means the users have the freedom to run, copy, distribute, study, change and improve the software. To develop technologically competent, humane, and socially responsible engineers and managers to meet the ever-growing challenges of the Global Environment:

\begin{itemize}[noitemsep]

   \item The freedom to run the program as you wish, for any purpose (freedom 0).

   \item The freedom to study how the program works, and change it so it does your computing as you wish (freedom 1). Access to the source code is a precondition for this.

   \item The freedom to redistribute copies so you can help others (freedom 2).

   \item The freedom to distribute copies of your modified versions to others (freedom 3). By doing this you can give the whole community a chance to benefit from your changes. Access to the source code is a precondition for this.

\end{itemize}

Developments in technology and network use have made these freedoms even more important now than they were in 1983. Nowadays, the free software movement goes far beyond developing the GNU system.


\end{document}
```

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

```
\documentclass[12pt,a4paper]{article}

\usepackage[left=2cm,right=2cm,top=2cm,bottom=2cm]{geometry}

\usepackage{blindtext} % For generating placeholder text

\title{Sample Document with Abstract}

\author{Dr. Neelambnike S}

\date{\today}

\begin{document}

\maketitle

\begin{abstract}

\blindtext % Generate a paragraph of placeholder text for the abstract

\end{abstract}

\section{Introduction}
```

\blindtext % Generate some placeholder text for the introduction

\section{Methodology}

\blindtext % Generate some placeholder text for the methodology section

\section{Results}

\blindtext % Generate some placeholder text for the results section

\section{Conclusion}

\blindtext % Generate some placeholder text for the conclusion section

\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]{article}

\usepackage[left=2cm,right=2cm,top=2cm,bottom=2cm]{geometry}

\usepackage{graphicx}

\usepackage{setspace}

\begin{document}

\begin{titlepage}

\centering

\includegraphics[width=0.5\textwidth]{vtu_logo.jpeg}\par\vspace{1cm}

{\scshape\Large Visvesvaraya Technological University \par}

\vspace{1cm}

{\scshape\Large Project Report\par}

\vspace{1.5cm}

{\huge\bfseries Title of the Project\par}

\vspace{2cm}

{\Large\itshape Your Name\par}

\vfill

Guide: \par

Dr.~Guide's \textsc{Name}

\vfill

%Bottom of the page

{\large \today\par}

\end{titlepage}

\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[12pt, a4paper]{report}
\usepackage{graphicx}
\usepackage{geometry}
\geometry{a4paper, total={170mm, 257mm}, left=20mm, right=20mm, top=20mm, bottom=20mm}
\thispagestyle{empty}

\begin{document}

    \begin{titlepage}
        \begin{center}
            \textbf{{\large VISVESVARAYA TECHNOLOGICAL UNIVERSITY}}\\
            {\normalsize Jnana Sangama, Belgaum-590018}\\
            \vspace{0.5in}
            \includegraphics[scale=0.1]{vtu-logo.png}\\
            \vspace{0.5in}
            \textbf{CERTIFICATE}\\
            \vspace{0.3in}
            This is to certify that \\
            \vspace{0.2in}
            \underline{\hspace{10cm}}\\
            \vspace{0.2in}
            (Name of the student)\\
            \vspace{0.2in}
            bearing University Seat Number \\
            \vspace{0.2in}
            \underline{\hspace{10cm}}\\
            \vspace{0.2in}
            has satisfactorily completed the project work entitled \\
            \vspace{0.2in}
            \underline{\hspace{10cm}}\\
            \vspace{0.2in}
```

```
                    (Title of the project)\\
                    \vspace{0.2in}
                    towards the partial fulfillment of the requirements for the award of the degree
of\\
                    \vspace{0.2in}
                    \textbf{BACHELOR OF ENGINEERING\\IN\\COMPUTER SCIENCE AND
ENGINEERING}\\
                    \vspace{0.5in}
                    \textbf{Guide} \hspace{3.5in} \textbf{Head of the Department}\\
                    \vspace{0.3in}
                    \underline{\hspace{6cm}} \hspace{1.5in} \underline{\hspace{6cm}}\\
                    \vspace{0.1in}
                    \textbf{(Guide's Name)} \hspace{2.7in} \textbf{(HOD's Name)}\\
                    \vspace{0.1in}
                    \textbf{(Guide's Designation)} \hspace{2in} \textbf{(HOD's Designation)}\\
                    \vspace{0.1in}
                    \textbf{(Department of CSE)} \hspace{2.1in} \textbf{(Department of CSE)}\\
                    \vspace{0.1in}
                    \textbf{[College Name]}\\
                    \vspace{0.1in}
                    \textbf{[Location]}\\
                    \vspace{0.1in}
                    \textbf{[Month Year]} % Replace with current month and year
                \end{center}
        \end{titlepage}
\end{document}
```

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

```
\documentclass{article}
\usepackage{array, booktabs, multicol, multirow} % Load necessary packages
\renewcommand{\arraystretch}{1.2} % Adjust vertical spacing in tables

\begin{document}
        \centering
        \textbf{\Large{Student Details and Marks}} % Title
```

```
\vspace{0.1in}


\begin{table}[h]
    \centering
    \begin{tabular}{|c|c|c|c|c|c|} % Define table with 6 columns, all centered
        \hline
        \multirow{2}{*}{\textbf{S.No}} & \multirow{2}{*}{\textbf{USN}} & \multirow{2}{*}{\textbf{Student Name}} & \multicolumn{3}{c|}{\textbf{Marks}} \\ % Multirow for headers spanning 2 rows, Multicolumn for header "Marks" spanning 3 columns
        \cline{4-6} % Horizontal line from column 4 to 6
        & & & \textbf{Subject1} & \textbf{Subject2} & \textbf{Subject3} \\ % Sub-headers for marks
        \hline
        \multicolumn{1}{|c|}{1} & \multicolumn{1}{c|}{4XX22XX01} & \multicolumn{1}{c|}{Name 1} & 89 & 60 & 90 \\ % Data rows
        \hline
        \multicolumn{1}{|c|}{2} & \multicolumn{1}{c|}{4XX22XX02} & \multicolumn{1}{c|}{Name 2} & 78 & 45 & 98 \\
        \hline
        \multicolumn{1}{|c|}{3} & \multicolumn{1}{c|}{4XX22XX03} & \multicolumn{1}{c|}{Name 3} & 67 & 55 & 59 \\
        \hline
    \end{tabular}
\end{table}


\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[10pt,a4paper]{article}
\usepackage[utf8]{inputenc}
\usepackage{amsmath}
\usepackage{amsfonts}
\usepackage{amssymb}
\usepackage{caption}
\usepackage{subcaption}
```

```
\usepackage{graphicx}
\usepackage[left=2cm,right=2cm,top=2cm,bottom=2cm]{geometry}
\begin{document}
\section*{Subfigure Demo}
\begin{figure}[h]
\centering
\begin{subfigure}[b]{0.3\textwidth}
\centering
\includegraphics[width=\textwidth]{g1.png}
\caption{$y=x$}
\label{fig:y equals x}
\end{subfigure}
\hfill
\begin{subfigure}[b]{0.3\textwidth}
\centering
\includegraphics[width=\textwidth]{g2.png}
\caption{$y=3\sin x$}
\label{fig:three sin x}
\end{subfigure}
\hfill
\begin{subfigure}[b]{0.3\textwidth}
\centering
\includegraphics[width=\textwidth]{g3.png}
\caption{$y=5/x$}
\label{fig:five over x}
\end{subfigure}
\caption{Three simple graphs arranged side-by-side}
\label{fig:three graphs}
\end{figure}
\end{document}
```

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

```
\documentclass{article}
```

```
\usepackage{amsmath} % Required for mathematical environments and commands

\begin{document}

	\section*{Equations Set 1} % Section header for the first set of equations

	\begin{align} % Begin the align environment for multiple equations

		x &= -b \pm \sqrt{\sqrt[4]{b^2 - 4ac}} \notag \\ % First equation with \notag to suppress numbering

		x &= \frac{-b \pm \sqrt{22 - 4 \cdot 1 \cdot (-8)}}{2 \cdot 1} = \frac{-b \pm \sqrt{\sqrt{4 + 32}}}{2} = \frac{-b \pm \sqrt{2}}{2} \notag % Second equation with \notag to suppress numbering

	\end{align} % End the align environment

	\section*{Equations Set 2} % Section header for the second set of equations

	\begin{align} % Begin the align environment for multiple equations

		\varphi_{\sigma}^{\lambda} \cdot A_{t} &= \sum_{\pi \in C_{t}} \text{sgn}(\pi) \cdot \varphi_{\sigma}^{\lambda} \cdot \varphi_{\pi}^{\lambda} \notag \\ % First equation with \notag to suppress numbering

		&= \sum_{\tau \in C_{\sigma}^{t}} \text{sgn}(\sigma^{-1} \tau \sigma) \varphi_{\sigma}^{\lambda} \varphi_{\sigma^{-1} \tau \sigma}^{\lambda} \notag \\ % Second equation with \notag to suppress numbering

		&= A_{\sigma}^{t} \varphi_{\sigma}^{\lambda} \notag % Third equation with \notag to suppress numbering

	\end{align} % End the align environment

\end{document}
```

8. Develop a LaTeX script to demonstrate the presentation of Numbered theorems, definitions,

corollaries, and lemmas in the document

```
\documentclass{article}

\usepackage[english]{babel}

\usepackage{amsthm}

\newtheorem{theorem}{Theorem}[section]

\newtheorem{corollary}{Corollary}[theorem]

\newtheorem{lemma}[theorem]{Lemma}

\theoremstyle{definition}

\newtheorem{definition}{Definition}[section]

\begin{document}

\section{Numbered theorems, definitions, corollaries and lemmas}

Theorems can easily be defined:

\begin{theorem}

Let \(f\) be a function whose derivative exists in every point, then \(f\) is
```

a continuous function.

\end{theorem}

\begin{theorem}[Pythagorean theorem]

\label{pythagorean}

This is a theorem about right triangles and can be summarised in the next

equation

\[x^2 + y^2 = z^2 \]

\end{theorem}

And aconsequence of theorem \ref{pythagorean} is the statement in the next

corollary.

\begin{corollary}

There's no right rectangle whose sides measure 3cm, 4cm, and 6cm.

\end{corollary}

You can reference theorems such as \ref{pythagorean} when a label is assigned.

\begin{lemma}

Given two line segments whose lengths are \(a\) and \(b\) respectively there is a

real number \(r\) such that \(b=ra\).

\end{lemma}

\begin{definition}[Absolute value function]

**The absolute value function can be specified as a two-part definition as follows: **

$

|x| =

\left\{

\right.

$

\begin{array}{ll}

x &\mbox{if } x \geq 0 \\-x & \mbox{if } x < 0

\end{array}

\end{definition}

\end{document}

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}
\usepackage{tikz}
\begin{document}
\begin{center}
\Large{\textbf{Hierarchy of Linux distributions}}
\end{center}
\begin{figure}[h]
\centering
\begin{tikzpicture} [every node/.style = {shape=rectangle, rounded corners, draw,
align=center}]
\path [draw,thick,-]
node (root)[red] {GNU/Linux}
[sibling distance=45mm, level distance=25mm]
child {node [cyan] {Debian}
[sibling distance=25mm, level distance=25mm]
child { node [cyan] {Ubuntu} }
child { node [cyan] {Linux Mint} }
%
child { node {Elementary} }
}
child {node [magenta] {RedHat}
[sibling distance=25mm, level distance=25mm]
child { node [magenta] {Fedora} }
child { node [magenta] {OpenSuse} }
}
child {node [blue] {Arch}
[sibling distance=25mm, level distance=25mm]
child { node [blue]{Manjaro} }
child { node [blue]{EndeavourOS} }
};
\end{tikzpicture}
\caption{GNU/Linux Operating System Family}
\end{figure}
```

```
\pagebreak
\begin{center}
\Large{\textbf{SUV Cars}}
\end{center}
\begin{figure}[h]
\centering
\begin{tikzpicture} [every node/.style = {shape=rectangle, rounded corners, draw,
align=center}]
\path [draw,thick,-]
[grow=-45]
node (root)[red] {SUV}
[sibling distance=45mm, level distance=25mm]
child {node [cyan] {Tata}
[sibling distance=25mm, level distance=25mm]
child { node [cyan] {Nexon} }
child { node [cyan] {Punch} }
%
child { node {Elementary} }
}
child {node [magenta] {Volkswagen}
[sibling distance=25mm, level distance=25mm]
child { node [magenta] {Taigun} }
child { node [magenta] {Virtus} }
}
child {node [blue] {Maruti}
[sibling distance=25mm, level distance=25mm]
child { node [blue]{Brezza} }
child { node [blue]{Vitara} }
};
\end{tikzpicture}
\caption{Car Brands Hierarchy}
\end{figure}
\end{document}
```

11. Develop a LaTeX script to present an algorithm in the document using

```
\documentclass{article}

\usepackage{algorithm}

\usepackage{algpseudocode}


\begin{document}


    \begin{algorithm}

        \caption{Bubble Sort}

        \begin{algorithmic}[1]

            \Procedure{BubbleSort}{$A, n$}

            \For{$i \gets 0$ to $n-1$}

            \For{$j \gets 0$ to $n-1-i$}

            \If{$A[j] > A[j+1]$}

            \State Swap $A[j]$ and $A[j+1]$

            \EndIf

            \EndFor

            \EndFor

            \EndProcedure

        \end{algorithmic}

    \end{algorithm}
```

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

```
\end{document}

\documentclass[6pt,a4paper]{report}

\usepackage[utf8]{inputenc}

\usepackage{amsmath}

\usepackage{amsfonts}

\usepackage{amssymb}

\usepackage{graphicx}

\usepackage[left=3cm,right=3cm,top=2cm,bottom=2cm]{geometry}

\author{Lekhaka}

\title{Varadhi}
```

\begin{document}

\maketitle

\chapter{Free Software}

\section*{What is Free Software?}

"\textbf{Free software}" means software that respects users' freedomand community. Roughly, it means that \textbf{the users have the freedom to run, copy, distribute, study, change and improve the software}. Thus, "free software" is a matter of liberty, not price. Tounderstand the concept, you should think of "\textit{free}" as in "\textit{free speech}," notasin "\textit{free beer}." We sometimes call it "\textbf{libre software}," borrowingtheFrenchorSpanish word for "free" as in freedom, to show we do not mean the doesfor them.When users don't control the program, we call it a "\textit{nonfree}" or "\textit{proprietary}"program. The nonfree program controls the users, and the developer controls theprogram;

this makes the program an instrument of unjust power. "\emph{Open source}" is something different: it has a very different philosophy basedondifferent values. Its practical definition is different too, but nearly all open sourceprogramsare in fact free. \section*{The Free Software Definition}

**The free software definition presents the criteria for whether a particular softwareprogramqualifies as free software. **

**\textbf{The four essential freedoms} **

A program is free software if the program's users have the four essential freedoms: \\\begin{itemize}

\item The freedom to run the program as you wish, for any purpose (freedom0). \item The freedom to study how the program works, and change it so it does your

computing as you wish (freedom 1). Access to the source code is a preconditionfor this. \item The freedom to redistribute copies so you can help others (freedom2). \item The freedom to distribute copies of your modified versions to others (freedom3). \end{itemize}

**By doing this you can give the whole community a chance to benefit fromyour changes. Access to the source code is a precondition for this. **

A program is free software if it gives users adequately all of these freedoms. Otherwise, itisnonfree. While we can distinguish various nonfree distribution schemes in termsof howfarthey fall short of being free, we consider them all equally unethical. \chapter{Listing Environment}

\begin{small}

\section*{Unordered lists}

\subsection*{Groceries List}

\begin{itemize}

\item Eggs

\item Milk

\item Biscuits

\item Rice

\end{itemize}

\subsection*{Football Teams}

```
\begin{itemize}
\item English Premier League
\begin{itemize}
\item Manchester United
\item Liverpool
\end{itemize}
\item La Liga
\begin{itemize}
\item Barcelona
\item Real Madrid
\end{itemize}
\item Bundesliga
\begin{itemize}
\item Bayern Munich
\item Borussia Dortmund
\end{itemize}
\end{itemize}
\section*{Ordered lists}
\subsection*{ICC WTC Rankings}
\begin{enumerate}
\item India
\item Australia
\item New Zealand
\end{enumerate}
\subsection*{Countries ranked by Market Cap}
\begin{enumerate}
\item Asia
\begin{enumerate}
\item China
\item Japan
\item India
\end{enumerate}
\item Europe
```

\begin{enumerate}

\item United Kingdom

\item France

\item Germany

\end{enumerate}

\end{enumerate}

\end{small}

\end{document}