UNIT-3

MATH, CHEMICAL, EQUATIONS & DOCUMENT CLASSES

Syllabus:-

→ Type Setting math in latex-
(math formulas, mathematical modes)

→ chemical equations

→ Beamer

→ Letter

→ Article

→ Report

→ Book

— ∘ —

UNIT-3
LATEX

=> Type setting math in latex:-

-> Math formulas, mathematical modes:-

=> Mathematical expressions:-

The feature that makes latex the right edition tool for scientific documents in the ability to render complex mathematical expressions.

-> Here, explains the basic commands to display equations.

Topic
=) Mathematical modes:-

Latex allows two writing modes for mathematical expressions: the Inline mode and the display mode. The first one is used to write formulas that are part of a text.

-> The second one is used to write expressions that are not part of a text & paragraph, and are therefore put on separate lines.

Type	Inline (with intext) formulas	Displayed math eq'ns	Displayed and automatically numbered eq'ns
1. environment	Math	Displaymath	equation
2. Latex shorthand	\(.....\)	\[.....\]	–
3. Tex shorthand	$.....$	$$.....$$	–
4. comment	–	–	Equation* (starred version) Supresses numbering. but required amsmath

Ex:- Inline mode :-

Ex:- ①

```
\Document class { article}
\ usepackage {amsmath}
\begin {document}
        In physics, the mass-energy equivalence
    is stated
        by the equation $E=MC^1 2$, discovered
    in 1905 by Albert Einstein.
\end {document}.
```

Output :-

In physics, the mass-energy equivalence is stated by the equation $E = mc^2$, discovered in 1905 by Albert Einstein.

⇒ Display mode :-

```
\documentclass{article}
\usepackage{amsmath}
\begin{document}
The mass-energy equivalence is described
by the famous equation.
$$E = mc^2$$
Discovered in 1905 by albert Einstein.
In natural units ($c$ = 1), the formula
expresses the identity.
\begin{equation}
E=m
\end{equation}
\end{document}
```

Output

The mass-energy equivalence is described by the famous equation

$$E = mc^2$$

Discovered in 1905 by Albert Einstein. In natural units (c = 1), the formula expresses the identity

$$E=m \tag{1}$$

5) math formulas:-

Ex:- ①

```
\ document class{article}
\use package {ams math}
\begin{document}
 1+2 = 3 \\
\end{equation}
 a+b=c
\end{equation}
\begin{equation*}
 1+2 =3
\end{equation*}
 \begin{equation*}
\end{document}
```

Out put

$$1+2=3 \quad (1)$$

$$a+b=c \quad (2)$$

$$1+2=3$$

Ex:- (2)

```
\documentclass{article}
\usepackage{amsmath}
\usepackage{amsfonts}
\usepackage{amssymb}
\begin{document}
\begin{equation*} a=b \end{equation*}   (* removes eqn number)
\begin{equation} a=b \end{equation}
\begin{equation} \label{xx}
\begin{split} a+=b+c-d \\ & \quad +e-f \\
& =g+h \\ & =i
\end{split}                              (split → devides)
\end{equation}
\begin{multline} a+b+c+d+e+f \\           (multline → two lines)
\end{multline}
\begin{gather}
a_1=b_1+c_1 \\ a_2=b_2+c_2-d_2+e_2
\end{gather}
\begin{align}                            (align → center alignment)
a_1=b_1+c_1 \\ a_2=b_2+c_2-d_2+e_2
\end{align}
\begin{align}
a_{11}& =b_{11}& a_{12}& =b_{12} \\
a_{21}& =b_{21}& a_{22}& =b_{22}+c_{22}
\end{align}                              (& symbol sets left & right alignment)
```

```
\begin{fdalign*}
a_{11} + b_{11} = c_{11} \quad a_{12} = b_{12} \\
b_{21} = c_{21} \quad a_{22} = b_{22} + c_{22}
\end{fdalign*}
\end{document}
```

→ fdalign* → formula left align

Output

$$a = b$$
$$a = b \qquad (1)$$

$$a = b + c - d + e - f = g + h = i \qquad (2)$$

$$a + b + c + d + e + f \qquad (3)$$

$$a_1 = b_1 + c_1 \qquad (4)$$
$$a_2 = b_2 + c_2 - d_2 + e_2 \qquad (5)$$

$$a_1 = b_1 + c_1 \qquad (6)$$
$$a_2 = b_2 + c_2 - d_2 + e_2 \qquad (7)$$

$$a_{11} = b_{11} \qquad a_{12} = b_{12} \qquad (8)$$
$$a_{21} = b_{21} \qquad a_{22} = b_{22} + c_{22} \qquad (9)$$

$$a_{11} + b_{11} = c_{11} \qquad a_{12} = b_{12}$$
$$b_{21} = c_{21} \qquad a_{22} = b_{22} + c_{22}$$

Topic

Letter :-

```
\documentclass[10pt, a4paper]{letter}
\usepackage[latin1]{inputenc}
\address{idupulapaya}
\signature{Madhavi}
\begin{document}
\begin{letter}{rgukt iiit}
\opening{respected sir}
hai
    iam the student belongs to this college.
need to take leave because of my health
problems. kindly accept my leave.
\closing{thanking you sir}
\end{letter}
\end{document}
```

language selection

next → select wizards → choose quickletter

text

Output

idupulapaya
february 19, 2019

rgukt iiit
Respected sir

hai iam the student belongs to this college.
need to take leave because of my health problems.
kindly accept my leave

thanking you sir.

Madhavi.

⇒ Article and Book and Report :-

An "article" does not provide "chapter", whereas "book" and "report" do. Thus, the first structuring element of an "article" is \section{name}.

→ In a "book", a header is automatically added to each page indicating the page number as well as the chapter name on even pages and the section name on odd pages.

→ A "book" is always 2-sided whereas in a "report" or "article" you have to specify it by using the "twoside" option. In addition, in a "book" and "report" the "titlepage" and "abstract" will take a whole page each, which is not the case for "article". In an "article", you can use the options "titlepage" and "abstract".

→ The "letter" provides a US-type letter format.

⇒ available document structure commands :-

Book :- \part{}, \chapter{}, \section{}, \subsection{}, \subsubsection{}, \paragraph{}, \subparagraph{}.

Report :- \part{}, \chapter{}, \section{}, \subselection{}, \subsubsection{}, \paragraph{} \subparagraph{}.

Article:- \part{}, \section{}, \subsection{},
\subsubsection{}, \paragraph{}, \subparagraph{}

Letter:-

A letter does not know the same structuring commands as other formats, but more specific commands like \signature{}, \address{}, \opening{} and \closing{}

topic
⇒ Book:-

```
\documentclass{book}
\usepackage[T1]{fontenc}
\usepackage[utf8][inputenc]
\title{42}
\author{Jane Doe}
\date{\today}
\begin{document}
\maketitle
\table of contents
\part{first part of this document}
\chapter{first}
\section{introduction}
lorem ipsum dolor sit amet, consectetur
adipisicingelit, sed do
eiusmod tempor incididunt ut labore et dolore
magnaaliqua. ut.
enim ad minim veniam, quis nostrud exercitation
ullamco.
```

\subsection{ Sample subsection}

lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do.

eiusmod tempor incididunt ut labore et dolore magna aliqua. ut.

enim ad minim veniam, quis nostud exercitation ullamco laboris..

\subsubsection{ Sample subsubsection}

lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do

eiusmod tempor incididunt ut labore et dolore magna aliqua. ut

enim ad minim veniam, quis nostud exercita....

\end{document}.

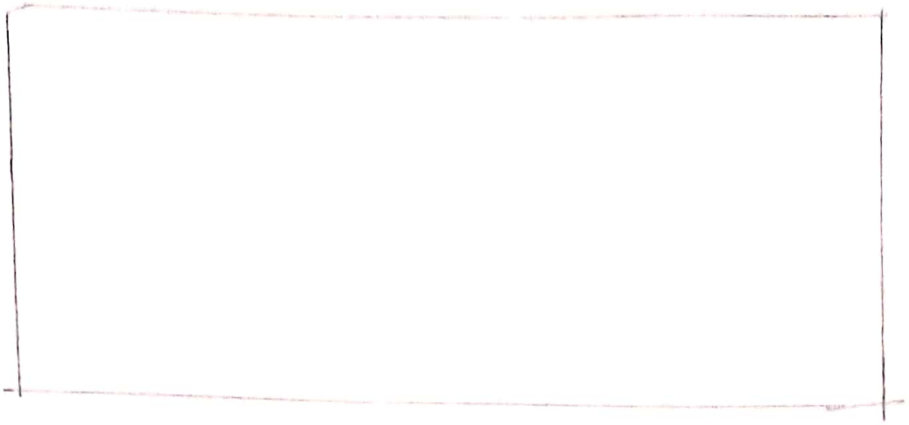
Output page-1

42

Jane Doe

February 20, 2019.

Output Page. 2

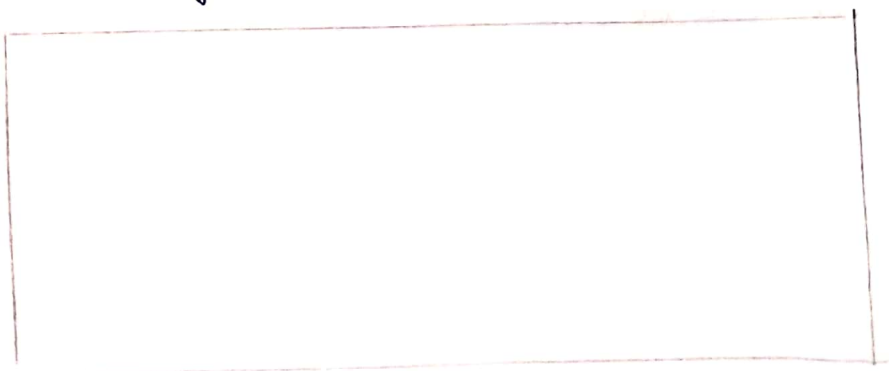


Output page. 3

Contents

1 first part of this document 5 (bold.)
1 First bold 7
1.1. Introduction. 7
1.1.1 Sample subsection. 7

Output page-4



Output Page. 5

part 1

First part of this document

output page-6

Output page-7

chapter 1 bold

First bold

1.1. Introduction bold

lore. . . . . .

. . . . . exercitation ullamco

1.1.1 Sample subsection bold

Lorem ipsum dolor sit amet . . . . . .

. . . . . ullamco laboris.

Sample subsubsection bold

Lorem ipsum . . . . . .

. . . . . quis sunt exercita.

TOPIC

⇒ Article:-

```
\Document class {article}
\use package [utf8] {inputenc}
\title {Sections and chapters}
\author {Gubert farnsworth}
\date {\today}
\begin {document}
\make title
\section {introduction}
```

text

This is the first section

lorem ipsum dolor sit amet, consectetuer adipisung
edit. Etiam lobortisfaulisis sem. Nullam nec mi et
neque pharetra sollicitudin. praesent imperdictmlsec ante.
Donec ullamcoiper ifelis non sodales....

```
\section {second section}
```

text

lorem ipsum dolor sit amet, consectetuer adipisung elit.
Etiam bbortis faciliisisgem. Nullam nec miet neque pharetra.
Sollicitudin. praesent imperdiet mi necante...

```
\end {document}.
```

Sections and chapters

Gubert Farnsworth

February 20, 2019.

1. Introduction → bold.

This is the first

Lorem . . . . . .

. . . . . felis non sodales.

2. Second section → bold

Lorem. . . . . .

. . . . . imperdiet

minecaute. . .

Repeat:-

\documentclass{ourpaper}
\begin{document}
\tableofcontents{}
\chapter{Editing compile}
\section{first compile}

How to comple basic hellow world into a pdf.

write your favorite text editor create file and copy/paste the following (with hello.tex):

\subsection{output formats}

different output formats (dvi, pdf)

The output of this command \$latex hello.tex will be a dvi
file (hello.dvi). This file (.dvi) can be converted by \$dvipdf
hello.dvi the get an pdf file from tex file, run this
Command \$texi2pdf hello.tex

\chapter{Document Structure}
\section{Reserved chapecteres}

The following symbols characters are reserved by latex because
they introduce a command and have a special meaning.

\end{document}.

output page(1)

Contents bold

1. Editing compile bold
   1.1 first compile 2
      1.1.1 output formats 2
2. Document Structure bold
   2.1 Reserved charecters 3

1

→ chapters should be printed
→ table of contents to be printed automatically

output page(2)

Chapter 1 bold

Editing compile bold

1.1 first compile bold

how to compile basic hello . . . .

write . . . . . hello.tex):

1.1.1. output formats bold

different out put formats (dvi, pdf)

. . . . . .

- - - - - . pdflatex hello.tex.

2

output page(3)

chapter 2

Document Structure

2.1 Reserved charecters.

the following symbols charecters . . . .

- - - - - . Special meaning.

3.

Beamer :- Ubuntu (0.5)

```
\documentclass[11pt]{beamer}
\usepackage[utf8]{inputenc}
\usepackage[T1]{fontenc}
\usepackage{Lmodern}
\usepackage[english]{babel}
\usetheme{Cambridgeus}
\begin{document}
\author{IIIT ongole}
\title{RGUKT}
\begin{frame}[plain]
\maketitle
\end{frame}
\begin{frame}
\frametitle{introduction}
Dr. APJ. Abdul Kalam IIIT ongole.
\end{frame}
\begin{frame}
gud mrg !!
\end{frame}
\end{document}
```

- \documentclass[11pt]{beamer} → open wizards → Quick Beamer presentation → to create program
- utf8 → unique text format; inputenc → input to convert encoding
- fontenc → output to convert split
- Lmodern → themes
- babel → text print which language
- \usetheme{Cambridgeus} → titlepage.
- \begin{frame}[plain] ... \maketitle ... \end{frame} → titlepage.
- \begin{frame} ... \frametitle{introduction} ... \end{frame} → one slide.
- \begin{frame} ... \end{frame} → next frame → (a) slide.

To apply next ↳ to adding picture → open wizard → to select → insert picture.

- → fonts
- → Symbols
- → Styles

output frame (1)

RGUKT

IIIT ongole

February 22, 2019

output frame (2)

Introduction

Dr. APJ. Abdul Kalam IIIT ongole

output frame (3)

gudmrg.

— o —

⇒ chemical Equations:-

```
\documentclass{article}
\usepackage{chemfig}
\begin{document}
\chemfig{O=H=N}
\\
\chemfig{P=O=N}
\\
\chemfig{A*3(-B=N-)}
\chemfig{A=[:50]B-[:25]C-[::50]}
\end{document}
```

\\ → next line spacing; \\ → word & word next spacing

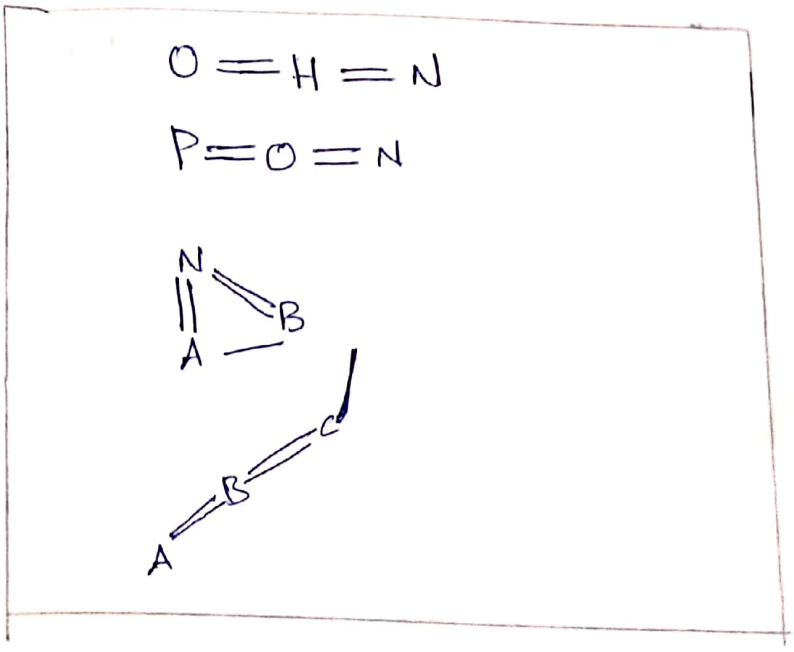
single line printed. double line printed.

double line printed. single line printed.

cross = point

cross straight printed.

output



— o —