[This question paper contains 8 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 1949 **H**

Unique Paper Code : 62353425

Name of the Paper : SEC-2: Mathematical Typesetting System: LaTeX

Name of the Course : **B.A. (Prog.) CBCS (LOCF)**

Semester : IV

Duration : 2 Hours Maximum Marks : 38

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. **All** questions are compulsory.

1. Fill in the blanks : (1×5=5)

   (a) The combination of symbols \: is used in LaTeX to _____ between the words.

   (b) In PSTricks, PS stands for _____.

(c) The symbol $ can be produced in LaTeX using the command _____.

(d) For plotting a function with PSTricks, we need the _____ package.

(e) _____ package is used to include images in beamer presentation.

2. Attempt any **six** parts : (2.5×6=15)

(i) Find the errors in the following LaTeX source code and write its correct version.

```
\documentclass {article}

\date {today}

\maketitle

\begin {document}

\begin{item}

\item Here is some \textbf{boldfaced} text.

\item Here is some \emph{emphasized} text.

\end{item}
```

(ii) Write the code in LaTeX to get the following output :

$$\hat{a} + \overline{b} = \begin{pmatrix} r_1 \\ \vdots \\ r_m \end{pmatrix}$$

(iii) Write any three commands to display the mathematical expression $\alpha_{10} + \beta_{12} = d^2$ in LaTeX.

(iv) Typeset the following in LaTeX in the mentioned three ways :

$S = \{a,b,c\}$

$S = \{a, b,c\}$

$S = \{a,\ b,c\}$

(with small space, medium space and large space in between comma ',' and b)

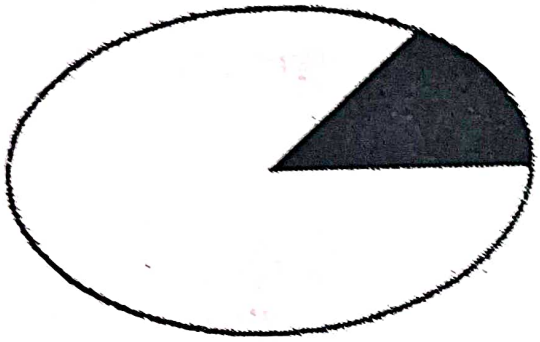
(v) Write the code in LaTeX to get the following output :

$$\int_0^{\infty} e^{x^2} dx = c$$

(vi) Write the LaTeX command to insert a picture of size 4cm × 4cm in your LaTeX document.

(vii) Write the command in PSTricks to plot the function $y = \sin 2x,\ 0 \leq x \leq 2\pi$.

(viii) Write the command in PSTricks to draw an ellipse with a shaded sector :



3. Attempt any **four** parts : (4.5×4=18)

(i) Write the command in PSTricks to plot the functions $y = \sqrt{x}$ and $y = -\sqrt{x}$, for $0 \leq x \leq 2$, with these functions shown as dotted curves.

(ii) Write the LaTeX code for the given expression:

1 Introduction

Analysis is the area of mathematics.

1.1 Series

It is a sub part of analysis which contains series.

1.1.1 Fourier Series

It is sub part of series.

2 Sequence

This contain sequences.

(iii) Give the LaTeX command to obtain the following mathematical expression :

$$\sin^{-1} x + \cos^{-1} x = \frac{\pi}{2} \quad (1)$$

$$U_n = \prod_{1 \le i \le j \le n} (x_i - x_j) \quad (2)$$

$$z = \int_2^{\infty} \frac{x}{\sqrt{1-x^2}} \quad (3)$$

(iv) Give the LaTeX command to obtain the following expression :

$$\begin{bmatrix} 2 & 3 & 7 \\ 5 & 6 & 1 \\ 3 & 4 & 2 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$$

(v) Give the LaTeX command to obtain the following table expression :

Company	Production
Hero	500
Yamaha	450
Royal En-field	280

Table 1: Two wheeler company productions

(vi) Write the LaTeX code for the following beamer presentation.

(Slide 1)

Numerical Analysis

Prof. Alex John

May 20, 2023

(Slide 2)

Introduction

Numerical analysis is the area of *mathematics* and *computer science* that creates, analyzes, and implements algorithms for solving numerically the problems of continuous mathematics. If $\cos\theta = 0$ and $0 \leq \theta \leq 2\pi$, then $\theta = \frac{\pi}{2}$ or $\theta = \frac{3\pi}{2}$

(Slide 3)