Unique Paper Code	: **62353325_OC**
Name of the Paper	: **SEC : Latex and HTML**
Name of the Course	: **B. A. (Prog.) (CBCS)**
Semester	: **III**
Time	: **2 Hrs**
Maximum Marks	: **38**

Attempt any four questions. All questions carry equal marks.

1. Write codes in Latex to draw a circle with shaded sector. Also label its radius.

Write codes in Latex to create a beamer presentation on the Pythagorean Theorem (with at least three slides). Be sure to include diagrams of right triangles.

Write codes in HTML to create a web page showcasing some of your mathematical interests (at least three interests). Make one of your interests in the list a **hyperlink**.

2. Write codes in Latex to typeset the following

$$\frac{\frac{a^2}{b^2}-\frac{ab}{cd}}{\frac{4}{ab^2}-\frac{3}{c^{-1}d}}=\frac{ab-2cd}{a^2c^2+\frac{6+4ac}{b^2d}}.$$

Write codes in Latex to typeset the following

$$\begin{bmatrix} \sin\theta & \cos\theta \\ \cos^{-1}\theta & \sec^{-1}\theta \end{bmatrix}.$$

Write codes in HTML to create a web page with a numbered list displaying titles of three papers (having different colors) of your curriculum.

3. Write codes in Latex to typeset the following

$$\int_{-\infty}^{\infty} e^{x^2}\,dx = \sqrt{\pi} \text{ and } \sin\alpha \pm \sin\beta = 2\sin\tfrac{1}{2}(\alpha \pm \beta)\cos\tfrac{1}{2}(\alpha \mp \beta).$$

Write codes in Latex to draw a square and an equilateral triangle using **PSTricks** and mark their vertices.

Write codes in Latex to create a beamer presentation on the circumference of a circle (with at least three slides), with first slide being the title slide. Use Latex's picture environment to draw the image of a circle on the second slide while labelling its circumference.

4. Write codes in Latex to plot the functions $\sin x$ and $\sin 3x$ over $-2\pi \le x \le 2\pi$. Show the function $\sin x$ as a solid curve and $\sin 3x$ as a dotted curves.

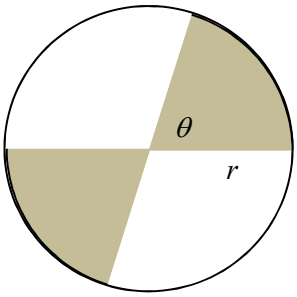
Write codes in HTML to create a web page containing a numbered list of five universities. One of the universities in the list should have big font size.

Write codes in Latex to create a beamer presentation of at least three slides on Prime numbers.

5. Write codes in Latex for the following

$$(1+x)^n = 1 + \frac{nx}{1!} + \frac{n(n-1)x^2}{2!} + \cdots.$$

Write codes in Latex to draw the following



Write codes in Latex to create a beamer presentation of (at least three slides) on a mathematical topic of your choice excluding the Pythagorean Theorem and Prime numbers. Also include diagrams.

6. Write codes in Latex for the following

$$\begin{aligned} x_{2^n} &= 1 + \frac{1}{2} + \left(\frac{1}{3} + \frac{1}{4}\right) + \cdots + \left(\frac{1}{2^{n-1}} + \cdots + \frac{1}{2^n}\right) \\ &> 1 + \frac{1}{2} + \left(\frac{1}{4} + \frac{1}{4}\right) + \cdots + \left(\frac{1}{2^n} + \cdots + \frac{1}{2^n}\right) \\ &= 1 + \frac{1}{2} + \frac{1}{2} + \cdots + \frac{1}{2} \\ &= 1 + \frac{n}{2}. \end{aligned}$$

Write codes in Latex for the following

$$f(x) = a_0 + \sum_{n=1}^{\infty} \left(a_n \cos\frac{n\pi x}{L} + b_n \sin\frac{n\pi x}{L}\right).$$

Choose a theorem or a problem and write codes in HTML to create a web page showing its proof or solution.