Assignment for Academic Year 2024-2025 (Beginning January 2025)

CLASS: BA-2nd Year **Course Name: Integral Calculus**

Course Code: MATH309TH (SEC-1)

ASSIGNMENT-1

Attempt any **THREE** of the following questions:

Ques 1. Evaluate $\int \frac{2x^2+x+1}{(x-1)^2(x+2)}dx$.

Ques 2. Integrate $\int \frac{dx}{(x+2)\sqrt{x+3}}$.

Ques 3. Evaluate $\int_{\pi/6}^{\pi/3} \frac{dx}{1+\sqrt{\tan x}}$.

Ques 4. Obtain the reduction formula for $I_n = \int x^n e^x dx$. Hence evaluate I_4.

Ques 5. Write down the value of $\int_0^{\frac{\pi}{2}} sin^5\theta cos^6\,\theta\, d\theta$

ASSIGNMENT-2

Attempt any **THREE** of the following questions:

Ques 1. Find the length of the arc of the parabola $y^2 - 4y + 2x = 0$ which lies in the first quadrant.

Ques 2. Find the area bounded by the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$, the ordinates $x = c, x = d$ and the x axis. Deduce the area of whole ellipse.

Ques 3. Show that the volume of solid obtained by revolving the area included between the curves $y^2 = x^3$ and $x^2 = y^3$ about the x-axis is $\frac{5\pi}{28}$.

Ques 4. Change the order of integration and hence evaluate $\int_0^1 \int_{x^2}^{2-x} xydydx$.

Ques 5. Find the volume of the solid bounded by the coordinate planes and the planes $2x + y + z = 2, 2x + y + z = 4$.