CLASS XII
MATHS

DEFINITE INTEGRAL

4/6MARKS

1. $\int_0^{\frac{\pi}{2}} \frac{x\sin x\cos x}{\sin^4 x+\cos^4 x}\,dx$

2. $\int_0^{n} \frac{xTanx}{SecxCosecx}\,dx$

3. $\int_0^{\pi/4} \frac{\sin x+\cos x}{9+16\sin 2x}dx$

4. $\int_0^{\pi/2} \sin 2x.\log\tan x\ \mathrm{dx}$.

5. $\int_0^{3/2} |x\cos\pi x|\,dx$

6. $\int_0^{2} |x^2+2x-3|\,dx$

7. $\int_{-a}^{a} \sqrt{\frac{a-x}{a+x}}\,dx = a\pi$

8. $\int_0^{\frac{\pi}{4}} \log(1+\tan x)dx$

9. $\int_0^{\pi/2} \frac{1}{1+\sqrt{\cot x}}dx$

10. Evaluate $\int_0^{1} e^{2-3x}dx$ as a limit of a sum

11. $\int_0^{\pi/2} \frac{\cos x}{(1+\sin x)(2+\sin x)} dx$

12. $\int_3^6 (|x-3|+|x-4|+|x-5|) dx$

13. $\int_0^{\pi/2} \frac{\cos x}{1+\sin^2 x} dx$

14. $\int_0^{\pi/2} \frac{dx}{1+\tan x}$

15. $\int_0^{\pi} \frac{x dx}{a^2 \cos^2 x + b^2 \sin^2 x}$

16. $\int_0^a \frac{\sqrt{x}}{\sqrt{x}+\sqrt{a-x}} dx$

17. $\int_1^3 \frac{\sqrt{4-x}}{\sqrt{x}+\sqrt{4-x}} dx$

18. $\int_0^{\pi} \frac{x}{1+\sin x} dx$

19. Evaluate $\int_1^4 (x^2 - x) dx$ as the limit of sums.

20. $\int_0^{\pi} \log(1+\cos x)\, dx$.

21. $\int_0^{\pi} \frac{x Sinx}{1+Cos^2 x}$

22. Evaluate as limit sum $\int_1^3 (2x^2+5)\, dx$

23. Evaluate: $\int_0^{\pi} \frac{x}{(1+\cos^2 x)}\, dx$

24. $\int_{-1}^{3/2} |x \, Sin\pi x| \, dx$

25. Evaluate $\int_{-1}^{1} (|x-1|+|x|+|x+1|) dx$

26. Evaluate $\int_1^3 (2x^2 + 3x + 5)\, dx$ as limit of a sum.

27.Evaluate :- $\int_1^3 (x^2 + 5x + 1)\, dx$ as a limit of a sum.

APPLICATIONS OF DEFINITE INTEGRALS

1. Using integration find the area of the region bounded by the triangle whose vertices are (-1,1), (0,5) and (3,2).
2. Find the area of smaller region bounded by the ellipse $\frac{x^2}{16} + \frac{y^2}{9} = 1$ and the straight line $\frac{x}{4} + \frac{y}{3} = 1$
3. Sketch the region enclosed between circles $x^2 + y^2 = 1$ and $x^2 + (y - 1)^2 = 1$.
   Also find the area of region using integration
4. Find the area of the region enclosed between the two curves $x^2 + y^2 = 1$ *and* $(x-1)^2 + y^2 = 1$
5. Find the area of the region $\{(x, y): x^2 + y^2 \le 1 \le x + y\}$
6. Sketch the region common to the circle $x^2 + y^2 = 16$ and the parabola $x^2 = 6y$. Also, find the area of the region, using integration.
7. Make the rough sketch and find the area of the region (using integration) enclosed by the curves $y^2=4ax$ and $x^2=4ay$.
8. Make the rough Sketch and find the area of the region
   $\{(x, y): x^2 + y^2 \le 2ax, \quad y^2 \ge ax, \quad x \ge 0, y \ge 0\}$
9. Draw a rough Sketch of the region $\{(x, y): y^2 \le 4x,\ 4x^2 + 4y^2 \le 9\}$