CHAPTER -08

APPLICATION OF INTEGRALS

3 MARKS QUESTIONS

1. Find the area enclosed by the circle $x^2 + y^2 = a^2$. (A)

2. Find the area enclosed by the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$. (A)

3. Find the area of the region bounded by the ellipse $\frac{x^2}{4} + \frac{y^2}{9} = 1$. (A)

4. Find the area of the region bounded by the ellipse $\frac{x^2}{16} + \frac{y^2}{9} = 1$. (A)

5. Find the area bounded by the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ and the ordinates x=0 and x=ae, where $b^2 = a^2(1-e^2)$ and e<1. (A)

6. Find the area of the region bounded by the curve $y^2 = x$ and the lines x=1, x=4 and the x-axis in the first quadrant. (A)

7. Find the area of the region bounded by $y^2 = 9x$ and the lines x=2, x=4 and the x-axis in the first quadrant. (A)

8. Find the area of the region bounded by $x^2 = 4y$, y=2,y=4 and the y-axis in the first quadrant. (A)

9. Find the area of the region bounded by the curve $y=x^2$ and the line y=4. and the y-axis in the first quadrant. (A)

10. Find the area of the region bounded by the parabola $y=x^2$ and $y=|x|$. (S)

11. Find the area of the smaller part of the circle $x^2 + y^2 = a^2$ cut off by the line $x = \frac{a}{\sqrt{2}}$. (A)

12. The area between $x = y^2$ and x=4 is divided into equal parts by the line x=a, find the value of a. (A)

13. Find the area of region bounded by the curve $y^2=4x$, y-axis and the line x=3. (A).

14. Find the area bounded by the curve $x^2=4y$ and the line x=4y-2. (A)

15. Find the area of the region bounded by the curve $y^2=4x$ and the line x=3. (A)

16. Find the area lying in the first quadrant and bounded by the circle $x^2+y^2=4$ and the lines x=0, and x =2.

17. Find the area of the region bounded by the curves $y=x^2+2, y=x, x=0$ and x=3. (A)

18. Find the area of the region bounded by the curve $y^2=4x$, y-axis and the line y= 3. (A)

19. Find the area of the parabola $y^2=4ax$ bounded by its latus rectum. (A)

20. Find the smaller area enclosed by the circle $x^2+y^2=4$ and the line x+y=2. (A)

21. Find the area lying between the curves $y^2=4x$ and y=2x. (A)

22. Find the area of the region enclosed by the parabola $x^2=y$, the line y=x+2 and the x-axis. (A)

23. Find the area under the given curves and given lines $y=x^2$,x=1,x=2 and x-axis. (A)

24. Find the area under the given curves and given lines $y=x^4$,x=1,x=5 and x-axis. (A)

25. Find the area between the curves y = x and $y = x^2$. (A)

26. Find the area of the region lying in the first quadrant and bounded by $y=4x^2$.x=0,y=1 and y=4. (A)

27. Find the area bounded by the curve y=cosx between x=0 and $x=2\pi$. (A)

28.Find the area bounded by the curve y=sinx between x=0 and $x=2\pi$. (A)

29. Find the area bounded by the y-axis, y= cosx and y=sinx when $0 \le x \le \frac{\pi}{2}$ (S)

30. Find the area bounded by the curves $\{(x,y): y \ge x^2$ and $y=|x|\}$. (S)

31. Find the area bounded by the curve $y=x^3$, the x-axis and the ordinates x=-2 and x=1. (A)

32. Find the area bounded by the curve $y=x|x|$, x axis and ordinates x=-1 and x=1. (A)

33.Sketch the graph of $y=|x+3|$ and evaluate $\int_{-6}^{0}|x+3|dx$. (S)

FIVE MARKS QUESTION

1. Find the area of the region in the first quadrant enclosed by the x-axis, the line y=x, and the circle $x^2+y^2=32$. (A)

2. Find the area of the region in the first quadrant enclosed by x-axis, line $x=\sqrt{3}y$ and the circle $x^2+y^2=4$. (A)

3. Find the area lying above x-axis and included between the circle $x^2+y^2=8x$ and inside of the parabola $y^2=4x$. (A)

4. Using integration find the area of the region bounded by the triangle whose vertices are (1, 0), (2,2) and (3,1). (A)

5. Find the area of the region enclosed between the two circles:

$x^2 + y^2 = 4$ and $(x-2)^2 + y^2 = 4$. (A)

6. Find the area of the circle $4x^2 + 4y^2 = 9$ which is interior to the parabola $x^2=4y$. (A)

7. Find the area bounded by curves $(x-1)^2 + y^2 = 1$ and $x^2 + y^2 = 1$. (A)

8. Using integration find the area of the region bounded by the triangle whose vertices are (-1, 0), (1,3) and (3,2). (A)

9. Using integration find the area of the triangular whose sides have the equations y=2x+1, y=3x+1 and x=4. (A)

10. Prove that the curves $y^2 = 4x$ and $x^2 = 4y$ divide the area of the square by x=0, x=4, y=4 and y=0 into three equal parts. (A)

11. Find the area of the region $\{(x, y) : 0 \le y \le x+1, 0 \le x \le 2\}$. (A)

12. Find the area enclosed between the parabola $y^2 = 4ax$ and the line y=mx. (A)

13. Find the area enclosed by the parabola $4y=3x^2$ and the line 2y=3x+12. (A)

14. Find the area of the smaller region bounded by the ellipse

$\frac{x^2}{9} + \frac{y^2}{4} = 1$ and the line $\frac{x}{3} + \frac{y}{2} = 1$. (A)

15. Find the area of the smaller region bounded by the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ and the line $\frac{x}{a} + \frac{y}{b} = 1$. (A)

16. Find the area of the region enclosed by the parabola $x^2=y$, the line y=x+2 and the x-axis. (A)

17. Using the method of integration find the area bounded by the curve $|x| + |y| = 1$. (A)

18. Using the method of integration find the area of the triangle ABC, coordinates of whose vertices are A(2,0),B(4,5) and C(6,3). (A)

19. Using method of integration find the area of the region bounded by line 2x+y=4, 3x-2y=6 and x-3y+5=0 . (A)

20. Find the area of the region $\{(x, y) : y^2 \le 4x, 4x^2 + 4y^2 \le 9\}$. (S)

21. Find the area of the circle $x^2+y^2=16$ exterior to the parabola $y^2=6x$. (A)

22 Find the area of the region bounded by the two parabolas $y=x^2$ and $y^2=x$. (A)