CHAPTER 8

APPLICATION OF INTEGRALS

MULTIPLE CHOICE QUESTIONS (MCQ)

Sl.No	Question:
1	Area bounded by the curve $y = \sin x$ and the x-axis between $x = 0$ and $x = 2\pi$ is (*a*) 2 sq units b) 0 sq units (*c*) 3 sq units (*d*) 4 sq units
2	Area of the region bounded by the curve and the x-axis is--- (*a*) $\dfrac{49}{2}\pi$ sq units (*b*) 98π sq units (*c*) 49π sq units (*d*) 240π sq units
3	Area of the region bounded by the curve $x = 2y + 3$, the y-axis and between $y = -1$ and $y = 1$ is ----- (*a*) 4 sq units (*b*) $\dfrac{3}{2}$ sq units (*c*) 6 sq units (*d*) 8 sq units
4	The area enclosed by the circle $x^2 + y^2 = 8$ is – (a) 16 π sq units (b) 2 2 π sq units (c) 8 π sq units (d) $8\pi^2$ sq units
5	The area bounded between the curves $y^2 = 6x$ and $x^2 = 6y$ is ---- (*a*) 6 sq units (*b*) 12 sq units (*c*) 36 sq units (*d*) 24 sq units
6	The area bounded by the y-axis, $y = \cos x$ and $y = \sin x$, $0 \le x \le \dfrac{\pi}{2}$ is --- (*a*) $\sqrt{2}$ sq. units (*b*) $\sqrt{2}+1$ sq. units

	(c) $\sqrt{2}-1$ sq. units (d) $2(\sqrt{2}-1)$ sq. units
7	If the area bounded by the curves $y^2 = 4ax$ and $y = mx$ is $\frac{a^2}{3}$, then the value of m is--- (a) 2 (b) –2 (c) $\frac{1}{2}$ (d) 7
8	The area enclosed within the curve $|x| + |y| = 1$ is --- (a) 21 sq. units (b) 1.5 sq. units (c) 2 sq. units (d) 20 sq. units
9	The area bounded by the curve $x^2 = 4y$ and the straight line $x = 4y - 2$ is ---- (a) $\frac{3}{8}$ sq. units (b) $\frac{5}{8}$ sq. units (c) $\frac{7}{8}$ sq. units (d) $\frac{9}{8}$ sq. units
10	The area of the smaller region between the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ and the line $\frac{x}{a}+\frac{y}{b}=1$ in first quadrant is – (a) $\frac{1}{2}ab$ sq. units (b) $\frac{1}{2}\pi ab$ sq. units (c) $\pi\, ab$ sq. units (d) $\frac{ab}{4}(\pi-2)$ sq. units
11	The area enclosed by the circle $x^2 + y^2 = 16$ is ------ (a) 20 sq. units (b) 20 π sq. units (c) 16 π sq. units (d) 256 π sq. units
12	Area of the region in the first quadrant enclosed by the x-axis, the line $y = x$ and the circle $x^2 + y^2 = 32$ is --- (a) 16 π sq. units (b) 4 π sq. units (c) 32 π sq. units (d) 20π sq. units

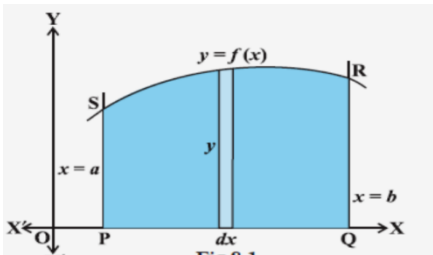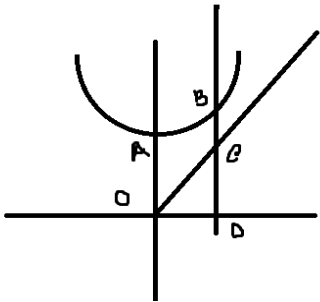|	
13	Area of the region bounded by the curve $y^2 = 4x$, y-axis and the line $y = 3$ is - (a) 2 sq. units (b) $\dfrac{9}{4}$ sq. units (c) $\dfrac{9}{3}$ sq. units (d) $\dfrac{9}{2}$ sq. units
14	The area of the region bounded by the parabolas $y = x^2$ and $y^2 = x$ is -- (a) $\dfrac{1}{3}$ sq. units (b) $\dfrac{2}{3}$ sq. units (c) $\dfrac{1}{6}$ sq. units (d) $\dfrac{1}{4}$ sq. units
15	Area of the region bounded by the curve $y = \cos x$ between $x = 0$ and $x = 2\pi$ is ---- (a) 4 sq. units (b) 3 sq. units (c) 2 sq. units (d) 1 sq. units
Q16.	The area included between the parabolas $y^2 = 2x$ and $x^2 = 2y$ in sq.units is (a) $\dfrac{2}{3}$ (b) $\dfrac{4}{3}$ (c) $\dfrac{8}{3}$ (d) $\dfrac{16}{3}$
Q17.	Area of the region bounded by the curve $y^2 = 4x, y-axis$ and the line $y = 3$ in sq.units is (a) $\dfrac{3}{4}$ (b) $\dfrac{4}{3}$ (c) $\dfrac{9}{4}$ (d) $\dfrac{16}{3}$
Q18	The area bounded by the curve $y = e^x$, the x-axis and between the lines $x = -2$, and $x = 1$ is $\dfrac{e^{k+1} - 1}{e^k}$ sq.units, then value of k is (a) -1 (b) 1 (c) 2 (d) -2
Q19	The area enclosed by the curve $y = \cos^2 x$, the lines $x = 0, x = \pi$ and the x-axis in sq.units is (a) $\dfrac{\pi}{2}$ (b) $\dfrac{\pi}{3}$ (c) $\dfrac{\pi}{4}$ (d) $\dfrac{\pi}{6}$

Q20	Area bounded by the line $x + y = 2$ and the co-ordinate axes in sq.units is (a) 1 (b) 2 (c) 3 (d) 4
Q21	The area bounded by $y = \dfrac{1}{x}$, the x - axis and between $x = -3$ and $x = -1$ in sq,units is (a) $\log 2$ (b) $\log 5$ (c) $\log 3$ (d) $-\log 2$
Q22	The area bounded by the curve , the x-axis and between $x = -1$ and $x = 1$ in sq.units is (a) 1 (b) 2 (c) 3 (d) 4
Q23	The area bounded by the curve $y = x^3$. the x - axis and the ordinates $x = 1$ and $x = 2$ in sq.units is (a) $\dfrac{3}{4}$ (b) $\dfrac{9}{4}$ (c) $\dfrac{15}{4}$ (d) $\dfrac{13}{4}$
Q24	Area bounded by the circle $x^2 + y^2 = 1$ and co-ordinates axes in first quadrant in sq.units is (a) $\dfrac{\pi}{3}$ (b) $\dfrac{\pi}{2}$ (c) $\dfrac{\pi}{6}$ (d) $\dfrac{\pi}{4}$
Q25	The area bounded by the parabola $y^2 = 4x$, latus rectum and the x-axis in sq.units is (a) $\dfrac{2}{3}$ (b) $\dfrac{1}{3}$ (c) $\dfrac{4}{3}$ (d) $\dfrac{1}{4}$
Q26	Area bounded by the ellipse $\dfrac{x^2}{9} + \dfrac{y^2}{4} = 1$ above x-axis in sq.units is (a) π (b) 2π (c) 3π (d) 4π
Q27	The area of the region bounded bounded by the parabola $y^2 = x$ and the straight line $y = x$ in sq,units is

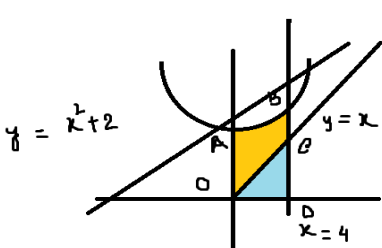|	
	(a) $\dfrac{5}{6}$ (b) $\dfrac{3}{5}$ (c) $\dfrac{3}{4}$ (d) $\dfrac{1}{6}$
Q28	Area of the region bounded by the curve $y = \cos x$ and between the lines $x = 0$ and $x = \pi$ in sq,units is (a) 1 (b) 2 (c) 3 (d) 4
Q29	Area of the region bounded by the curve $y = \sin x$ and between the lines $x=0$ and $x = 2\pi$ in sq,units is (a) 1 (b) 2 (c) 3 (d) 4
Q30	The area bounded by the curve $y^2 = 4ax$ and the lines $y = 2a$ and $y-axis$ in sq.units is (a) $\dfrac{2}{3}a^2$ (b) $\dfrac{4}{3}a^2$ (c) $\dfrac{5}{3}a^2$ (d) $\dfrac{7}{3}a^2$
31.	The area bounded by and the x-axis is 1) 4π 2) 2π 3) π 4) -2π
32	The area bounded by the curve $y = \sin x$, $x \in [0, 2\pi]$ and the x-axis is 1) 4 2) 0 3) 2 4) 1
33	The ratio in which the area bounded by the curves $y^2 = 12x$ and $x^2 = 12y$ is divided by the line x=3 is 1) 15:16 2) 15:49 3) 1:2 4) 2:1
34.	The area bounded by the lines $|x| + |y| = 1$ is

	1) 0
	2) 1
	3) 2
	4) 4
35	The area in the region $x > 0$, $y > 0$ bounded by $y = 4x^2$, $x = 0$, $y = 1$ and $y = 4$ is
	1) $\dfrac{7}{3}$
	2) $\dfrac{3}{7}$
	3) $\dfrac{1}{3}$
	4) $\dfrac{1}{7}$
36	The area bounded by $y = \log_e x$, the coordinate $x = e$ and $x -$ axis is
	1) 0
	2) 1
	3) 2
	4) E
37	The area bounded by $x^2 = y$, $y = x + 2$ and the $x -$ axis is
	1) $\dfrac{7}{3}$
	2) $\dfrac{5}{6}$
	3) $\dfrac{6}{5}$

	4) $\dfrac{3}{7}$
38	The area bounded by the y^- axis, $y = \cos x$, and $y = \sin x$ when $x \in [0, \dfrac{\pi}{2}]$ is 1) 2) 3) $+1$ 4)
39	What is the area enclosed by the ellipse $\dfrac{x^2}{9} + \dfrac{y^2}{4} = 1$ 1) 36π sq units 2) π sq units 3) 3π sq units 4) 6π sq units
40.	What is the smaller area enclosed by the circle $x^2 + y^2 = 4$ and the line $x + y = 2$. 1) $2(\pi + 2)$ 2) $\pi + 1$ 3) $\pi - 2$ 4) $\pi + 2$
41.	What is the area between the two parabolas $= x^2$ and $x = y^2$? 1) $\dfrac{1}{3}$ 2) $\dfrac{2}{3}$

	3) $\dfrac{\pi}{3}$ 4) $\dfrac{3}{\pi}$
42.	Area lying in the first quadrant and bounded by the circle $x^2 + y^2 = 4$ and the lines $x = 0$ and $x = 2$ is 1) $\dfrac{\pi}{3}$ 2) $\dfrac{\pi}{2}$ 3) $\dfrac{\pi}{4}$ 4) π
43.	What is the area bounded by the curve $= \cos x$ between $x = 0$ and $x = 2\pi$? 1) 1 2) 2 3) 3 4) 4
44.	The area bounded by the curve $y = x^3$, the $x-$ axis and the ordinates $x = -2$ and $x = -1$ 1) $\dfrac{4}{15}$ 2) $\dfrac{-15}{4}$ 3) $\dfrac{4}{17}$

	4) $\dfrac{17}{4}$
45.	What is the area bounded by the curve $y = \sin x,\ y = \cos x,\ y-axis$ when $0 \le x \le \dfrac{\pi}{2}$? 1) 2) 3) 4)
46	Which of the following options is best suitable for the area under the given graph a) b) c) d)
47	The area of the triangular region whose sides have the equations y= 2x +1, y = 3x + 1 and x = 4 is a)8 units b)12 units c) 28 units d)16 units
48	The area bounded by the curves, y = x^2 + 2, y = x, x = 0, and x = 3, is represented by the area a) OCBAO b)OCDO c)AOCBA d)AODBA

49	If A be the area of region between y=x² and y=x and B be the area of region between y=x² and y=-x then a)A=B b)A= -B c)A=2B d)2A=B
50	The area common to $y^2 \geq 4x$ and $x^2+y^2 \geq 4$ is a) 8 units b) 4 units c)infinite d)no common area
51	Smaller area enclosed by the circle $x^2 + y^2 = 4$ and the line $x + y = 2$ is (A) $2(\pi - 2)$ (B) $\pi - 2$ (C) $2\pi - 1$ (D) $2(\pi + 2)$
52	The area of the region bounded by the curves $x = at^2$ and $y = 2at$ between the ordinate corresponding to t = 1 and t = 2 is a) 56a²/3 sq units. b)56/3 sq units. C)56a²sq units. d)6a²/3 sq units.
53	The area enclosed by the circle $x^2 + y^2 = 2$ is equal to a) 2π units b) 4πunits c) $\sqrt{2}\pi$units d)$2\pi^2$ units
54	The area of the region bounded by x-axis, the lines $x = 2$ and y=x is a) 2 units b) 4 units c) $\sqrt{2}$ units d)π units
55	The area bounded by the region $\left\{(x,y):x^2+y^2 \leq 1 \leq x+y\right\}$ is: (a) $\dfrac{\pi}{4}-\dfrac{1}{2}$ (b) $\dfrac{\pi}{4}+\dfrac{1}{2}$ (c) $\dfrac{\pi}{2}+\dfrac{1}{4}$ (d) $\dfrac{\pi}{2}-\dfrac{1}{4}$
56	Find the area of the region bounded by the two parabolas $y = x^2$ and $y^2 = x$. (a) 1/2 (b) 2 (c) 3 (d) 1/3

57	Which is not a method to find area of a triangle whose side's equations are given
	a)Indefinite integration b)Heron's formula c)height-base method d)determinant method
58	Area under two curves If y=f(x) , y= g(x) where f(x) ≥ g(x) in the [a,b]
	a) b) c) d)
59	Region between $y \leq x^2+2$ and $y \leq x$ in second quadrant has colour
	a)Yellow b)blue c)white d)none
60	Area bounded by the curve y = sin x between x = 0 and x = 2π
	a)8 units b)2 units
	c) 4 units d)6 units
61	The area bounded by the line 2y = 5x + 7, X-axis and the lines x = 2 and x = 8 is
	(A) 48 sq units (B) 96 sq units (C) 480 sq units(D) 960 sq units
62	The area enclosed by the circle $x^2 + y^2 = 9$ is
	(A) 2π sq units (B) 4π sq units (C) 6π sq units (D) 8π sq units
63	The area enclosed by the curve $x = 3 \cos\theta$ and$x = 2 \sin\theta$ is
	(A) 2π sq units (B) 4π sq units (C) 6π sq units (D) 8π sq units
64	The area of the region bounded by x-axis, $y = \cos x$ and$y = \sin x$, $0 \leq x \leq \frac{\pi}{2}$ is
	(A)$(\sqrt{2} - 1)$ sq units (B) $\sqrt{2}$ sq units (C) $(\sqrt{2} + 1)$ sq units(D) $(2\sqrt{2} - 1)$ sq units

65	For which value of 'm' is the area of the region bounded by the curve $y = x - x^2$ and the line y = mx (m > 1) equals 9/2? (A) 9 (B) 6 (C) 2 (D) 4
66	The area bounded by the curve $x^2 = 4y$ and the straight-line x = 4y – 2 is (A) $\frac{1}{8}$ sq unit (B) $\frac{3}{8}$ sq unit (C) $\frac{3}{4}$ sq unit (D) $\frac{9}{8}$ sq units
67	The area of the region bounded by the curves $y = |x - 1|$ and y = 3 - |x| is (A) 2 sq units (B) 3 sq units (C) 4 sq units (D) 6 sq units
S68	The area bounded by the region bounded by the curves s $y = |x - 2|, x = 1$ and $x = 3$ and X-axis is (A) 4 sq units (B) 3 sq units (C) 2 sq units (D) 1 sq unit
69	The area of the region bounded by the curve $y = \sqrt{(9 - x^2)}$ and X-axis is (A) 2.5π sq units (B) 4.5π sq units (C) 6.5π sq units (D) 8.5π sq units
70	For what value of K the area bounded by $y = Kx^2$ and $x = y^2$ is 1/3 sq unit. (A) 1 (B) 2 (3) 3 (D) -1
71	Area of the region bounded by $|x| + |y| = 2$ is _____ (A) 2 sq units (B) 4 sq units (C) 6 sq units (D) 8 sq units
72	The area bounded by the parabolas $y = (x + 1)^2$ and $y = (x - 1)^2$ and $y = \frac{1}{4}$ is (A) 4 sq units (B) $\frac{1}{6}$ sq units (C) $\frac{3}{4}$ sq units (D) $\frac{1}{3}$ sq units

73	The area bounded by the curve x = y and $y = \sqrt{x}$ is given by (A) 3 sq units (B) $\dfrac{1}{6}$ sq units (C) $\dfrac{4}{3}$ sq units (D) $\dfrac{1}{3}$ sq units
74	The ratio of the areas between the curve $y = \cos x$ and $y = \cos 2x$ and X-axis from x $= 0$ to $x = 0 \; to \; x = \dfrac{p}{3}$ is (A) 1:3 (B) 2:1 (C) $\sqrt{3}:1$ (D) None of these
75	The area bounded by the curve $x^2 + y^2 = 2ax$ is _____sq units. (A) pa^2 (B) $2pa^2$ (C) $4pa^2$ (D) $\dfrac{1}{2}pa^2$
76	The area enclosed by the parabola $y^2 = 2x$ and tangents through the point (-2, 0) is (a) 3 sq. units (b) 4 sq. units (c) 4/3 sq. units (d) 8/3 sq. units
77	The area of the region {(x, y) : $y^2 = x$, $x^2 + y^2 = 2$} is (a) $\left(\dfrac{\pi}{4} - \dfrac{1}{3}\right)$ sq. units (b) $\left(\dfrac{\pi}{4} + \dfrac{1}{3}\right)$ sq. units (c) $\left(\dfrac{\pi}{4} - \dfrac{1}{6}\right)$ sq. units (d) $\left(\dfrac{\pi}{2} + \dfrac{1}{3}\right)$ sq. units
78	

	The area lying above x-axis and included between the circle $x^2 + y^2 = 8x$ and inside of parabola $y^2 = 4x$ is (a) 1/3 (2 + 3π) sq. units (b) 2/3 (4 + 3π) sq. units (c) (6 + 3π) sq. units (d) 4/3 (8 + 3π) sq. units
79	Area of the region bounded by the curve $y=x^2$ and line y=16 is (a) 32/3 (b) 256/3 (c) 64/3 (d) 128/3
80	Find the area of the region bounded by the curve $y= x^3$,the line x= 2, x = 5 and the x-axis (a) 173.50 (b) 230.25 (c) 175.35 (d) 152.25
81	The area enclosed by the parabola y2 = 2x and its tangents through the point (-2 , 0) is (a) 8/3 (b) 4 (c) 3 (d) none of these
82	The area bounded by y = 2cosx , x = 0 to x = 2π and the axis of x in square units is (a) 6 (b) 4 (c) 8 (d) 7
83	Smaller area enclosed by the circle $x^2+y^2 =4$ and the line x + y = 2 is (a) 2(π -2)

(b) π -2

(c) 2π -1

(d) 2(π + 2)

84	Area bounded by the lines y = |x| and y = 1 – |x – 1| is equal to
	
	    (a) 4 sq. units
	      (b) 6 sq. units
	      (c) 2 sq. units
	      (d) 8 sq. Units

85	The area bounded by the lines |x| + |y| = 1 is (a) 1 sq. unit (b) 2 sq. units (c) 2√2 sq. units (d) 4 sq. units
86	. Area of triangle whose two vertices formed from the x-axis and line y = 3 – |x| is (a) 9 sq. units (b) 12 sq. units (c) 3 sq. units (d) None of these
87	Area of the region bounded by the curve y = cos x between x = 0 and x = π is (a) 2 sq. units (b) 4 sq, units (c) 3 sq.units (d) 1 sq. units
88	If y = 2 sin x + sin 2x for 0 ≤ x ≤ 2π, then the area enclosed by the curve and x-axis is

	(a) 92 sq. units
	(b) 8 sq. units
	(c) 12 sq. units
	(d) 4 sq. units
89	The area bounded by the lines y = 4x + 5, y = 5 – x and 4y = x + 5 is (a) 15/2 sq. units (b) 9/2 sq. units (c) 13/2 sq. units (d) None of these
90	The area bounded by $y=(2x)^{1/2}$ and $x=(2y)^{1/2}$ is (a) 4/3 sq. units (b) 13/2 sq. units (c) 12/5 sq. units (d) 42/5 sq. units

ANSWERS

QUESTION NUMBER	ANSWER
1	d
2	a
3	c
4	d
5	b
6	d
7	a
8	c
9	d

10	d
11	c
12	b
13	b
14	a
15	a
16	B
17	C
18	C
19	a
20	b
21	C
22	a
23	C
24	D
25	C
26	C
27	d
28	B
29	D
30	A
31	2
32	1
33	2

34	3
35	1
36	2
37	2
38	4
39	4
40	3
41	1
42	4
43	4
44	4
45	3
46	D
47	A
48	C
49	A
50	C
51	B
52	a
53	a
54	a
55	a
56	d
57	a

58	b
59	b
60	c
61	b
62	c
63	c
64	a
65	d
66	d
67	c
68	d
69	b
70	a
71	d
72	c
73	d
74	b
75	a
76	d
77	d
78	d
79	b
80	d
81	a

82	c
83	b
84	a
85	b
86	d
87	a
88	c
89	a
90	a

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