

5. APPLICATION OF DEFINITE INTEGRATION

I. MCQ (2 marks each)

Ex.1: The area of the region bounded by the curve $y = \sin x$, X-axis and the lines $x = 0, x = 4\pi$ is sq. units.

- (A) 2 (B) 4 (C) 8 (D) 16

Ex.2: The area of the region bounded by the ellipse $x^2/64 + y^2/100 = 1$, is sq. units.

- (A) 64π (B) 80π (C) $\pi/80$ (D) 100π

Ex.3: The area bounded by the parabola $y^2 = x$ along the X-axis & the lines $x=0, x=2$ is sq. units.

- (A) $4/3$ (B) $(4\sqrt{2})/3$ (C) $2/3$ (D) $(2\sqrt{2})/3$

Ex.4: The area bounded by the curve $y^2 = x^2$, and the line $x = 8$ is

- (A) 16 sq. units (B) 64 sq. units (C) 32 sq. units (D) 4 sq. units

Ex.5: The area of the region included between the parabolas $y^2 = 16x$ and $x^2 = 16y$, is given by sq. units

- (A) 256 (B) $16/3$ (C) $256/3$ (D) $64/3$

Ex.6: The area enclosed between the two parabolas $y^2 = 20x$ and $y = 2x$ is sq. units.

- (A) $20/3$ (B) $40/3$ (C) $10/3$ (D) $50/3$

Ex.7: The area bounded by the parabola $y^2 = 32x$ the X-axis and the latus rectum is sq. units

- (A) $512/3$ (B) $512/5$ (C) 512 (D) $64/3$

Ex.8: The area bounded by the ellipse $x^2/4 + y^2/25 = 1$ & and the line $x/2 + y/5 = 1$ is sq. units

- (A) $5(\pi-2)$ (B) $(5/2)(\pi-2)$ (C) $(5/3)(\pi-2)$ (D) $(5/4)(\pi-2)$

Ex.9: The area of triangle ΔABC whose vertices are $A(1,1), B(2,1)$ & $C(3,3)$ issq. units.

- (A) 1 (B) 2 (C) 3 (D) 4

Ex.10: The area enclosed by the line $2x + 3y = 6$ along X-axis & the lines $x = 0, x = 3$ is sq. units.

- A) 1 (B) 2 (C) 3 (D) 4

II. Very Short Answers (1 mark)

Ex. 1 : Find the area bounded by the curve $y^2 = 36x$, the line $x = 2$
in first quadrant .

Ex.2: Find the area bounded by the curve $y = \sin x$, the lines $x = 0$ and $x = \pi/2$.

Ex.3: Find the area enclosed between $y = \cos x$ and X-axis between the
lines $x = \pi/2$ & $x \leq 3\pi/2$

Ex.4: Find the area of the region bounded by the parabola $y^2 = 32x$ and
its Latus rectum in first quadrant .

Ex.5: Find the area of the region bounded by the curve $y = x^2$, the
X-axis and the given lines $x = 0$, $x = 3$

Ex.6: Find the area of the region bounded by the curve $y^2 = 8x$, the
X-axis and the given lines $x = 1, x = 3, y \geq 0$

Ex.7: Find the area of the region bounded by the curve $x^2 = 12y$, the
Y-axis and the given lines $y = 2, y = 4, x \geq 0$

Ex.8: Find the area of the ellipse $x^2 / 1 + y^2 / 4 = 1$, in first quadrant

Ex.9: Find the area of sector bounded by the circle $x^2 + y^2 = 25$,
in the first quadrant.

Ex.10: Using integration, find the area of the region bounded by the line
 $2y + x = 8$, X-axis and the lines $x=2$ & $x = 4$.

III. Short Answers (3 marks)

Ex.1: Find the area enclosed between the X-axis and the curve $y = \sin x$
for values of x between 0 to 2π .

Ex.2: Find the area of the region bounded by the parabola $x^2 = 4y$ and
The X-axis & the line $x = 1, x = 4$.

Ex.3: Find the area of the region bounded by the parabola $y^2 = 16x$ and
the line $x = 4$.

Ex.4: Find the area of the region bounded by the curves
 $x^2 = 8y, y = 2, y = 4$ and the Y-axis, lying in the first quadrant.

Ex.5: Find the area of the region bounded by the curve $y = \sin x$,
the X-axis and the given lines $x = -\pi$, $x = \pi$

Ex.6: Find the area of the ellipse $x^2/36 + y^2/64 = 1$, using integration.

IV. Long answers (4 Marks)

Ex.1 : Find the area of the region bounded by the curves $y^2 = 4ax$
and $x^2 = 4ay$.

Ex.2: Find the area of the region lying between the parabolas
 $4y^2 = 9x$ and $3x^2 = 16y$

Ex.3: Find the area of the sector bounded by the circle $x^2 + y^2 = 16$,
& the line $y = x$ in the first quadrant.

Ex.4: Find the area of the region included between $y = x^2 + 5$ and
the line $y = x + 7$

Ex.5: Find the area enclosed between the circle $x^2 + y^2 = 9$,
along X – axis and the line $x = y$, lying in the first quadrant.

Ex.6: Find the area enclosed between the circle $x^2 + y^2 = 1$ and
the line $x + y = 1$, lying in the first quadrant.

Ex.7: Find the area of the region bounded by the curve
 $(y - 1)^2 = 4(x + 1)$ and the line $y = (x - 1)$.