Model Question Paper

Integral Calculus - Part III

12th Standard

Maths

Reg.No. : | | | | | | |

I.Answer all questions

II.Use blue pen only.

Time : 01:00:00 Hrs

Total Marks : 90

Section-A

3 x 1 = 3

1) Volume of solid obtained by revolving the area of the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ about major and minor axes are in the ratio.

(a) $b^2:a^2$ (b) $a^2:b^2$ (c) $a:b$ (d) $b:a$

2) The volume generated by rotating the triangle with vertices at $(0,0)$, $(3,0)$and $(3,3)$about **x** axis is.

(a) 18π (b) 2π (c) 36π (d) 9π

3) The length of the arc of the curve $x^{2/3}+y^{2/3}=4$ is.

(a) 48 (b) 24 (c) 12 (d) 96

Section-B

3 x 3 = 9

4) Evaluate the following problems using second fundamental theorem: $\int_0^{\frac{\pi}{2}} e^{3x}cosxdx$

5) Evaluate: $\int\limits_0^{\frac{\pi}{2}} cos^9x\ \ dx$

6) Evaluate: $\int\limits_0^{\frac{\pi}{2}} cos^8x\ \ dx$

Section-C

6 x 6 = 36

7) Find the area of the region bounded by the line y=2x+1, y=3, y=5 and y-axis.

8) Find the area of the region bounded by $x^2=36\ y$, y - axis , y = 2 and y = 4

9) Find the area of the circle whose radius is a.

10) $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$is revolved about major axis a>b>0

11) Evaluate the following problems using second fundamental theorem $\int\limits_0^{\frac{\pi}{2}} sin2xcosxdx$

12) Evaluate : $\int\limits_0^{\frac{\pi}{6}} cos^73xdx$

Section-D

5 x 10 = 50

13) Find the area of the region bounded by the ellipse $\frac{x^2}{9}+\frac{y^2}{5}=1$ between the two latus rectums

14) Find the length of the curve $4y^2=x^3$ between x=0 and x=1

15) Show that the surface area of the solid obtained by revolving the arc of the curve y=sinx from x=0 to $x=\pi$ about x-axis is $2\pi[\sqrt{2}+log(1+\sqrt{2})]$

16) Find the surface area of the solid generated by revolving the arc of the parabola $y^2=4ax$, bounded by its latus rectum about x - axis.

17) Prove that the curved surface area of a sphere of radius r intercepted between two parallel planes at a distance a and b from the centre of the sphere is $2\pi r(b-a)$and hence deduct the surface area of the sphere $(b>a)$

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