RAVI MATHS TUITION CENTER ,GKM COLONY, CHENNAI- 82. PH: 8056206308

Applications of Integration full test

12th Standard

Maths

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

Exam Time : 03:00:00 Hrs

Total Marks : 90

ANSWER ALL

20 x 1 = 20

1) The value of $\int_{-4}^{4}\left[tan^{-1}\left(\frac{x^2}{x^4+1}\right)+tan^{-1}\left(\frac{x^4+1}{x^2}\right)\right]dx$ is

(a) π (b) 2π (c) 3π (d) 4π

2) The value of $\int_{-\frac{\pi}{4}}^{\frac{\pi}{4}}\left(\frac{2x^7-3x^5+7x^3-x+1}{cos^2x}\right)dx$ is

(a) 4 (b) 3 (c) 2 (d) 0

3) If $f(x)=\int_0^x t\,cos\,t\,dt,\ then\ \frac{dx}{dx}$

(a) cos x-x sin x (b) sin x+x cos x (c) x cos x (d) x sin x

4) The area between y^2 x = 4 and its latus rectum is

(a) $\frac{2}{3}$ (b) $\frac{4}{3}$ (c) $\frac{8}{3}$ (d) $\frac{5}{3}$

5) The value of $\int_0^1 x(1-x)^{99}dx$ is

(a) $\frac{1}{11000}$ (b) $\frac{1}{10100}$ (c) $\frac{1}{10010}$ (d) $\frac{1}{10001}$

6) The value of $\int_0^{\pi}\frac{dx}{1+5^{cos\,x}}$ is

(a) $\frac{\pi}{2}$ (b) π (c) $\frac{3\pi}{2}$ (d) 2π

7) The value of $\frac{(n+2)}{(n)}=90$ then n is

(a) 10 (b) 5 (c) 8 (d) 9

8) The value of $\int_0^{\frac{\pi}{6}} cos^3 3x dx$

(a) $\frac{2}{3}$ (b) $\frac{2}{9}$ (c) $\frac{1}{9}$ (d) $\frac{1}{3}$

9) The value of $\int_0^{\pi} sin^4 x dx$ is

(a) $\frac{3\pi}{10}$ (b) $\frac{3\pi}{8}$ (c) $\frac{3\pi}{4}$ (d) $\frac{3\pi}{2}$

10) The value of $\int_0^{\infty} e^{-3x}x^2dx$ is

(a) $\frac{7}{27}$ (b) $\frac{5}{27}$ (c) $\frac{4}{27}$ (d) $\frac{2}{27}$

11) If $\int_a^a \frac{1}{4+x^2}dx=\frac{\pi}{8}$ then a is

(a) 4 (b) 1 (c) 3 (d) 2

12) The volume of solid of revolution of the region bounded by y^2 = x(a − x) about x-axis is

(a) πa^2 (b) $\frac{\pi a^2}{4}$ (c) $\frac{\pi a^2}{5}$ (d) $\frac{\pi a^2}{6}$

13) If f(x)$f(x)=\int_1^x \frac{e^{sin^u}}{u}du, x>1$ *and* $\int_1^3 \frac{e^{sinx^2}}{x}dx=\frac{1}{2}[f(a)-f(1)]$, then one of the possible value of a is

(a) 3 (b) 6 (c) 9 (d) 5

14) The value of $\int_0^1 (sin^{-1}x)^2dx$

(a) $\frac{\pi^2}{4}-1$ (b) $\frac{\pi^2}{4}+2$ (c) $\frac{\pi^2}{4}+1$ (d) $\frac{\pi^2}{4}-2$

15) The value of $\int_0^a (\sqrt{a^2-x^2})^2dx$

(a) $\frac{\pi a^2}{16}$ (b) $\frac{3\pi a^4}{16}$ (c) $\frac{3\pi a^2}{8}$ (d) $\frac{3\pi a^4}{8}$

16) If $\int_0^x f(t)dt=x+\int_x^1 tf(t)dt$ then the value of f (1) is

(a) (b) 2 (c) 1 (d)

17) The value of $\int_0^{\frac{2}{3}} \frac{dx}{\sqrt{4-9x^2}}$ is $\frac{1}{2}$ $\frac{3}{4}$

(a) $\frac{\pi}{6}$ (b) $\frac{\pi}{2}$ (c) $\frac{\pi}{4}$ (d) π

18) The value of $\int_{-1}^{2} |x|dx$

(a) $\frac{1}{2}$ (b) $\frac{3}{2}$ (c) $\frac{5}{2}$ (d) $\frac{7}{2}$

19) For any value of n∈Z, $\int_0^{\pi} ecos^{2x} cos^3[(2n+1)x]$ is

(a) $\frac{\pi}{2}$ (b) π (c) 0 (d) 2

20) The value of $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} sin^2 x cosx dx$ is

(a) $\frac{3}{2}$ (b) $\frac{1}{2}$ (c) 0 (d) $\frac{2}{3}$

ANSWER ANY 7 7 x 2 = 14

21) Find an approximate value of $\int_1^{1.5} x^2 dx$ by applying the right-end rule with the partition {1.1,1.2,1.3,1.4,1.5}.

22) Evaluate the following integrals as the limits of sums.
$\int_1^2 4x^2 - 1)dx$

23) Evaluate the following definite integrals:
$\int_0^{\frac{\pi}{2}} e^x \left(\frac{1+sinx}{1+cosx}\right) dx$

24) Evaluate the following integrals using properties of integration:
$\int_0^{2\pi} xlog\left(\frac{3+cos\ \ x}{3-cos\ \ x}\right)dx$

25) Evaluate the following integrals using properties of integration:
$\int_0^1 |5x-3|dx$

26) Evaluate the following integrals using properties of integration:
$\int_{\frac{\pi}{8}}^{\frac{3\pi}{8}} \frac{1}{1+\sqrt{tanx}}dx$

27) Evaluate the following:
$\int_0^{\frac{1}{2}} \frac{e^{a\ \ sin^{-1}x} sin^{-1}x}{\sqrt{1-x^2}}dx$

28) Evaluate the following
$\int_0^{\pi/4} sin^6 x\ \ dx$

29) Find the area of the region bounded by 3x − 2y + 6 = 0 , x = −3, x =1 and x-axis.

30) Find the area of the region bounded by the line y = 2x + 5 and the parabola $y = x^2 - 2x$.

ANSWER ANY 7 7 x 3 = 21

31) Evaluate : $\int_0^{\frac{\pi}{3}} \frac{sec\ x\ tan\ x}{1+sec^2 x}dx$

32) Evaluate: $\int_0^{\frac{\pi}{2}} \frac{cos\theta}{(1+sin\theta)(2+sin\theta)}d\theta$

33) Show that $\int_0^{\frac{\pi}{2}} \frac{dx}{4+5sinx} = \frac{1}{3} \log_e 2$

34) Prove that $\int_0^{\frac{\pi}{4}} \frac{sin2xdx}{sin^4 x+cos^4 x} = \frac{\pi}{4}$

35) Evaluate $\int_0^{\pi} \frac{x}{1+sinx}$ dx

36) Prove that $\int_0^{\frac{\pi}{4}}$ log(1+tan x)dx= $\frac{\pi}{8}$ log2.

37) Evaluate $\int_0^{\frac{\pi}{2}} \frac{dx}{4\sin^2 x + 5\cos^2 x}$

38) Find the volume of a right-circular cone of base radius r and height h.

39) Find the volume of the solid formed by revolving the region bounded by the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2}$ 1, a > b about the major axis.

40) Find, by integration, the volume of the solid generated by revolving about y-axis the region bounded between the curve y=$\frac{3}{4}\sqrt{x^2 - 16}, x \geq 4$ the y-axis, and the lines y =1 and y = 6.

ANSWER ANY 7 7 x 5 = 35

41) Evaluate $\int_1^4 (2x^2 - 3)$ dx, as the limit of a sum

42) Evaluate $\int_0^1 e^{-2x}(1 + x - 2x^3)dx$

43) Evaluate $\int_0^{\frac{\pi}{2}}$ ($\sin^2 x + \cos^4 x$) dx

44) Evaluate $\int_0^{2a} x^2\sqrt{2ax - x^2}dx$

45) Find the area of the region bounded by the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

46) Find the area of the region bounded by x−axis, the curve y = cos x, the lines x = 0 and x =π .

47) Find the area of the region bounded between the parabolas y^2 x = 4 and x^2 y = 4.

48) Find the area of the region in the first quadrant bounded by the parabola y^2 x=4, the line x+y=3 and y-axis

49) Find, by integration, the area of the region bounded by the lines 5x − 2y =15, x + y + 4 = 0 and the x-axis

50) Using integration find the area of the region bounded by triangle ABC, whose vertices A, B, and C are (−1,1), (3, 2), and (0,5) respectively

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