DALMIA HIGHER SECONDARY SCHOOL
DALMIAPURAM – 621651
Std : 12   MATHEMATICS   TIME: 1.50HRS
CHAPTER – 9   TEST -1   MARKS : 50
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2 MARKS : ANSWERS ANY 10 Q   10X 2 =20

1. Evaluate:$\int_0^3 (3x^2 - 4x + 5)$ dx

2. Evaluate: $\int_1^2 \frac{x}{(x+1)(x+2)}$ dx

3. Evaluate $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} x \cos x \, dx$.

4. Evaluate $\int_{-\log 2}^{\log 2} e^{-|x|}$dx

5. Evaluate $\int_0^a \frac{f(x)}{f(x)+f(a-x)}$dx .

6. Evaluate $\int_2^3 \frac{\sqrt{x}}{\sqrt{5-x}+\sqrt{x}}$dx .

7. Evaluate $\int_b^a \frac{1}{a^2+x^2} dx$.

8. Find the values of $\int_0^{\frac{\pi}{2}} sin^4x \, cos^6x$dx

9. Evaluate$\int_0^1 x^3(1-x)^4$ dx .

10. Evaluate$\int_0^\infty \frac{x^n}{n^x} dx$, where n is a positive integer ≥ 2

11. Find the area of the region bounded between the parabola $y^2 = 4ax$and its latus rectum.

12. Find the volume of the solid formed by revolving the region bounded by the parabola$y = x^2$, x-axis, ordinates x = 0 and x = 1 about the x-axis.

13. Evaluate the integrals as the limits of sums: $\int_0^1 (5x + 4)$ dx

14. Evaluate the integrals using properties of integration:

$\int_{\frac{\pi}{8}}^{\frac{3\pi}{8}} \frac{1}{1+\sqrt{tanx}}$ dx

15. Evaluate: $\int_0^{\frac{\pi}{2}} sin^{10}xdx$

16. Evaluate: $\int_0^{\frac{\pi}{2}} cos^7xdx$

17. Evaluate : $\int_0^\infty x^2 e^{-3x} dx$

3 MARKS : ANSWERS ANY 10 Q   10 X 3 =30

18. Evaluate:$\int_0^{\frac{\pi}{3}} \frac{secxtanx}{1+sec^2x}$ dx

19. Evaluate$\int_0^{\frac{\pi}{2}} \begin{vmatrix} cos^4x & 7 \\ sin^5x & 3 \end{vmatrix} dx$.

20. Evaluate$\int_0^\infty e^{-ax}x^n dx$, where a > 0

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

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

23. Evaluate the definite integrals $\int_0^{\frac{\pi}{2}} e^x \left(\frac{1+sin\,x}{1+cos\,x}\right)$ dx

24.Evaluate the integrals using properties of integration
$\int_{-5}^5 x \cos \left(\frac{e^x-1}{e^x+1}\right)$ dx

25. Evaluate the integrals using properties of integration:
$\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} (x^5 + xcosx + tan^3x + 1)dx$

26. Evaluate the integrals using properties of integration: $\int_3^4 sin^2x$ dx

27. $\int_0^{\frac{2\pi}{2}} xlog \left(\frac{3+cosx}{3-cosx}\right) dx$

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5 MARKS: ANSWERS ANY 10 Q   10X 5 =50

1. Evaluate $\int_1^4 (2x^2 + 3)\, dx$ as the limit of a sum.

2. Prove that $\int_0^{\frac{\pi}{4}} \log(1 + \tan x)\, dx = \frac{\pi}{8} \log 2$.

3. Show that $\int_0^1 (\tan^{-1} x + \tan^{-1}(1 - x))dx = \frac{\pi}{2}$ - $\log_e 2$

4. Evaluate: $\int_2^3 \frac{\sqrt{x}}{\sqrt{5-x}+\sqrt{x}}\, dx$.

5. Evaluate: $\int_{-\pi}^{\pi} \frac{\cos^2 x}{1+a^x}\, dx$.

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

7. Find the area of the region bounded between the parabola $y^2 = 4ax$ and its latus rectum

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

9. Find the area of the region bounded between the parabola $x^2 = y$ and the curve $y=|x|$

10. 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.

11. The curve $y = (x - 2)^2 + 1$ has a minimum point at P. A point Q on the curve is such that the slope of PQ is 2. Find the area bounded by the curve and the chord PQ.

12. Find the area of the region common to the circle $x^2 + y^2=16$ and the parabola $y^2= 6x$.

13.Find the volume of a sphere of radius a.

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

15. Find the volume of the solid formed by revolving the region bounded by the parabola $y = x^2$, x-axis, ordinates x = 0 and x = 1 about the x-axis.

16. 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.

17. Find, by integration, the volume of the container which is in the shape of a right circular conical frustum as shown in the Figure.