CUET Mathematics Test

Chapter: Integration and its Applications

General Instructions

1. Total Questions: **20**

2. Duration: **60 Minutes**

3. All questions are compulsory.

4. Each question carries **5 marks**.

5. For each correct answer: **+5 marks**.

6. For each incorrect answer: **-1 mark**.

7. No negative marking for unanswered questions.

8. Use of calculator or electronic devices is strictly prohibited.

9. Choose the most appropriate answer from the given options.

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1. Evaluate the indefinite integral: $\int \frac{\cos 2x - \cos 2\alpha}{\cos x - \cos \alpha} dx$

2. Find the value of: $\int \frac{dx}{\sqrt{1+\sin x}}$

3. Evaluate: $\int \frac{x^2+1}{x^4+1} dx$

4. Solve the integral: $\int \frac{dx}{x(x^n+1)}$

5. Evaluate the indefinite integral using substitution: $\int \frac{\sin x}{\sin(x-a)} dx$

6. Find the value of the definite integral: $\int_0^{\pi/2} \frac{\sqrt{\sin x}}{\sqrt{\sin x}+\sqrt{\cos x}} dx$

7. Evaluate: $\int_0^\pi \frac{x \sin x}{1+\cos^2 x} dx$

8. Find the value of $\int_{-1}^1 |x \cos(\pi x)| dx$

9. Evaluate the integral: $\int_0^1 \frac{\log(1+x)}{1+x^2} dx$

10. Determine the value of: $\int_0^\pi \log(1 + \cos x) dx$

11. Find the area of the region bounded by the curve $y^2 = 9x$ and the line $x = 4$ in the first quadrant.

12. Find the area of the region bounded by the ellipse $\frac{x^2}{16} + \frac{y^2}{9} = 1$ using integration.

13. Calculate the area bounded by the curve $y = \cos x$ between $x = 0$ and $x = 2\pi$.

14. Find the area of the region bounded by the parabola $y = x^2$ and the line $y = 4$.

15. Evaluate: $\int \frac{e^x(1+x)}{\cos^2(xe^x)} dx$

16. Find the area of the region included between the parabolas $y^2 = 4ax$ and $x^2 = 4ay$.

17. Evaluate the definite integral: $\int_0^{\pi/4} \log(1 + \tan x) dx$

18. Find the value of $\int \frac{dx}{\sin(x-a)\sin(x-b)}$

19. Evaluate: $\int_0^{\pi/2} \log(\sin x) dx$

20. Find the area bounded by the curve $y = x|x|$, x-axis and the ordinates $x = -1$ and $x = 1$.

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