

CUET Mathematics Test - Set 18

Chapter: Calculus - Integrals (Intermediate)

General Instructions

1. Total Questions: **15**
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 $\int \frac{\sin 2x}{a^2 \sin^2 x + b^2 \cos^2 x} dx$
- (A) $\frac{1}{a^2 - b^2} \log |a^2 \sin^2 x + b^2 \cos^2 x| + C$
 (B) $\frac{1}{a^2 + b^2} \log |a^2 \sin^2 x + b^2 \cos^2 x| + C$
 (C) $\log |a^2 \sin^2 x + b^2 \cos^2 x| + C$
 (D) $\frac{1}{2(a^2 - b^2)} \log |a^2 \sin^2 x + b^2 \cos^2 x| + C$
2. The value of $\int \frac{dx}{e^x + e^{-x}}$ is:
- (A) $\tan^{-1}(e^x) + C$
 (B) $\log |e^x + e^{-x}| + C$
 (C) $e^x - e^{-x} + C$
 (D) $\tan^{-1}(e^{-x}) + C$
3. $\int \frac{\cos 2x - \cos 2\alpha}{\cos x - \cos \alpha} dx$ is equal to:
- (A) $2[\sin x + x \cos \alpha] + C$
 (B) $2[\sin x - x \cos \alpha] + C$
 (C) $2[\cos x + x \sin \alpha] + C$
 (D) $\sin x + \cos \alpha + C$
4. Evaluate $\int \frac{x^2}{\sqrt{1-x^6}} dx$
- (A) $\frac{1}{3} \sin^{-1}(x^3) + C$
 (B) $\frac{1}{3} \cos^{-1}(x^3) + C$
 (C) $\sin^{-1}(x^3) + C$
 (D) $\frac{1}{2} \sin^{-1}(x^3) + C$
5. If $\int \frac{dx}{x+x \log x} = f(x) + C$, then $f(x)$ is:
- (A) $\log |1 + \log x|$
 (B) $\log |\log x|$
 (C) $1 + \log x$
 (D) $\frac{(1+\log x)^2}{2}$
6. $\int \frac{dx}{x\sqrt{x^2-1}}$ is:
- (A) $\sec^{-1} x + C$
 (B) $\sin^{-1} x + C$
 (C) $\tan^{-1} x + C$
 (D) $\log |x + \sqrt{x^2 - 1}| + C$
7. Evaluate $\int \frac{x+2}{(x+1)^2} dx$
- (A) $\log |x + 1| - \frac{1}{x+1} + C$
 (B) $\log |x + 1| + \frac{1}{x+1} + C$
 (C) $\frac{1}{x+1} + C$
 (D) $\log |x + 1| + C$
8. $\int \frac{\sin^2 x - \cos^2 x}{\sin^2 x \cos^2 x} dx$ is equal to:
- (A) $\tan x + \cot x + C$
 (B) $\tan x + \operatorname{cosec} x + C$
 (C) $-\tan x + \cot x + C$
 (D) $\tan x + \sec x + C$
9. The integral $\int \frac{xe^x}{(x+1)^2} dx$ is:
- (A) $\frac{e^x}{x+1} + C$
 (B) $\frac{-e^x}{x+1} + C$

- (C) $\frac{e^x}{(x+1)^2} + C$
 (D) $e^x(x+1) + C$
10. Evaluate $\int \frac{dx}{\sqrt{1+\sin x}}$
 (A) $\sqrt{2} \log |\tan(\frac{x}{4} + \frac{\pi}{8})| + C$
 (B) $2\sqrt{2} \sin(\frac{x}{2} - \frac{\pi}{4}) + C$
 (C) $2\sqrt{2} \log |\tan(\frac{x}{4} + \frac{\pi}{8})| + C$
 (D) None of these
11. If $\int \frac{dx}{\sqrt{x+x}} = k \log |1 + \sqrt{x}| + C$, then k is:
 (A) 1
 (B) 2
 (C) 1/2
 (D) 4
12. $\int e^x \left(\frac{1}{x} - \frac{1}{x^2}\right) dx$ is equal to:
 (A) $\frac{e^x}{x} + C$
 (B) $-\frac{e^x}{x} + C$
 (C) $e^x \log x + C$
 (D) $\frac{e^x}{x^2} + C$
13. The integral $\int \frac{\sin x}{\sin(x-a)} dx$ is:
 (A) $x \cos a + \sin a \log |\sin(x-a)| + C$
 (B) $x \sin a + \cos a \log |\sin(x-a)| + C$
 (C) $(x-a) \cos a + C$
 (D) $x \cos a - \sin a \log |\sin(x-a)| + C$
14. Evaluate $\int \sqrt{1 + \sin 2x} dx$
 (A) $\sin x - \cos x + C$
 (B) $\cos x - \sin x + C$
 (C) $\sin x + \cos x + C$
 (D) $-\sin x - \cos x + C$
15. $\int \frac{dx}{x^2+4x+13}$ is:
 (A) $\frac{1}{3} \tan^{-1}\left(\frac{x+2}{3}\right) + C$
 (B) $\frac{1}{2} \tan^{-1}\left(\frac{x+2}{3}\right) + C$
 (C) $\tan^{-1}\left(\frac{x+2}{3}\right) + C$
 (D) $\frac{1}{3} \tan^{-1}(x+2) + C$

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