MATHS

BOOKS - NTA MOCK TESTS

INDEFINITE INTEGRATION

Single Choice

1. The value obtained on $\int\sqrt{4-x^2}dx$ would be

A. $x\sqrt{\frac{4+x^2}{2}}+2\sin^{-1}x+C$

B. $x\sqrt{4+x^2}+2\sin^{-1}x+C$

C. $x\sqrt{4-x^2}+2\sin^{-1}\left(\frac{x}{2}\right)+C$

D. $\frac{x\sqrt{4-x^2}}{2}+2\sin^{-1}\left(\frac{x}{2}\right)+C$

Answer: D

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2. $\in \frac{\sin^8 x-\cos^8 x}{\left(1-2\sin^2 x\cos^2 x\right)}dx$ is equal to

A. $-\frac{1}{2}\sin 2x+c$

B. $-\sin^2 x+c$

C. $-\frac{1}{2}\sin x+c$

D. $\frac{1}{2}\sin 2x+c$

Answer: A

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3. If m is a non zero number and $\int \frac{x^{5m-1}+2x^{4m-1}}{\left(x^{2m}+x^m+1\right)^3}dx = f(x)+c$, then f(x) is equal to

A. $\frac{\left(x^{5m}-x^{4m}\right)}{2m\left(x^{2m}+x^m+1\right)^2}$

B. $\frac{1}{2m}\frac{x^{4m}}{\left(x^{2m}+x^m+1\right)^2}$

C. $\frac{x^{5m}}{\left(2mx^{2m}+x^m+1\right)^2}$

D. $\frac{2m\left(x^{5m}+x^{4m}\right)}{\left(x^{2m}+x^m+1\right)^2}$

Answer: B

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4. If $I_n = \int \sin^n x dx$, then $nI_n - (n-1)I_{n-2}$ equals

A. $\left(\sin^{n-1} x\right)(\cos x)$

B. $\left(\cos^{n-1} x\right)(\sin x)$

C. $-\left(\sin^{n-1} x\right)(\cos x)$

D. $-\left(\cos^{n-1} x\right)(\sin x)$

Answer: C

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5. $\int\left(\cos^{-3/7}x\right)\left(\sin^{-\frac{11}{7}}x\right)dx$ is equal to

A. $\log\left|\sin^{4/7}x\right|+c$

B. $\frac{4}{7}\tan^{4/7}x+c$

C. $-\frac{7}{4}\tan^{-4/7}x+c$

D. $\log\left|\cos^{3/7}x\right|+c$

Answer: C

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6. If $\int uv'''dx = uv' - vu' + a$, then a is equal to

A. $\int u''vdx$

B. $\int u'vdx$

C. $\int uv'dx$

D. $\int u''dx$

Answer: A

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7. $\int \frac{x^{e-1} + e^{x-1}}{x^e + e^x} dx$ is equal to

A. $\log_e(x^e + e^x) + c$

B. $e\log_e(x^e + e^x) + c$

C. $\frac{1}{e}\log_e(x^e + e^x) + c$

D. None of these

Answer: C

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8. If $\int \frac{(\sqrt{x})^5}{(\sqrt{x})^7 + x^6} dx = a\log\left(\frac{x^K}{x^K + 1}\right) + C$,

then value of a and K respectively ar

A. $\frac{5}{2}$ and $\frac{2}{5}$

B. $\frac{2}{5}$ and $\frac{5}{2}$

C. $\frac{5}{2}$ and 2

D. $\frac{2}{5}$ and 2

Answer: B

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9. $\int \frac{e^{3x}+e^{x}}{e^{4x}-e^{2x}+1}dx =$

A. $\tan^{-1}\left(e^{x}-e^{-x}\right)+c$

B. $\tan^{-1}\left(e^{x}+e^{-x}\right)+c$

C. $2\tan^{-1}\left(e^{x}-e^{-x}\right)+c$

D. $2\tan^{-1}\left(e^{x}+e^{-x}\right)+c$

Answer: A

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10. If $\int f(x)dxk = f(x),$ then $\int \{f(x)\}^2 dx = g(x) + c.\ g(x)$ is equal to

A. $\frac{1}{2}\{f(x)\}^2$

B. $\{f(x)\}^3$

C. $f(x)$

D. $\{f(x)\}^2$

Answer: A

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11. $\int\left\{\log(\log x)+\frac{1}{(\log x)^2}\right\}dx$, is equal to

A. $\log(\log x)+c$

B. $x\log(\log x)+c$

C. $x\left\{\log(\log x)-\frac{1}{\log x}\right\}+c$

D. $\frac{x}{\log x}+c$

Answer: C

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12. $\int(\tan 2x \tan 3x \tan 5x)dx$ is equal to

A.

$$\frac{1}{2}\log|\sec 2x| - \frac{1}{3}\log|\sec 3x| - \frac{1}{5}\log|\sec 5x| + c$$

B.

$$\frac{1}{2}\log|\sec 2| + \frac{1}{3}\log|\sec 3x| + \frac{1}{5}\log|\sec|5x\ | \ + c$$

C.

$$\frac{1}{5}\log|\sec 5x| - \frac{1}{2}\log|\sec 2x| = \frac{1}{3}\log|\sec 3x| + c$$

D. None of the above

Answer: C

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13. $\int e^x \left\{ \frac{1 + \sin x \cos x}{\cos^2 x} \right\} dx$ is equal to

A. $e^x \cos x + c$

B. $e^x \sec x . \tan x + c$

C. $e^x \tan x + c$

D. $e^x \cos^2 x - 1 + c$

Answer: C

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14. $\int \frac{\sqrt{\cot x}}{\sin x \cos x} dx = P\sqrt{\cot x} + Q$, then P equals to

A. 1

B. 2

C. -1

D. -2

Answer: D

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15. $\int e^{-2x} \sin 3x dx$ is equal to

A. $\frac{1}{13} e^{-2x} [\sin 3x + \cos 3x] + c$

B. $-\frac{1}{13} e^{-2x} [\sin x + x \cos 3x] + c$

C. $\frac{1}{13} e^{-2x} [2 \sin 3x + 3 \cos 3x] + c$

D. $-\frac{1}{13} e^{-2x} [2 \sin 3x + 3 \cos 3x] + c$

Answer: D

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16. $\int x^3 x dx$ is equal to

A. $\frac{x^4 \log x}{4} + c$

B. $\frac{1}{16}\left[4x^4 \log x - x^4\right] + c$

C. $\frac{1}{8}\left[x^4 \log x - 4x^2\right] + c$

D. $\frac{1}{16}\left[4x^4 \log x + x^4\right] + c$

Answer: B

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17. $\int \frac{5\left(x^6 + 1\right)}{x^2 + 1} dx$ is equal to

A. $5\left(x^7 + x\right)\tan^{-1} x + c$

B. $x^5 - \frac{5}{3}x^3 + 5x + c$

C. $3x^4 - 5x^2 + 15x + c$

D. $5\tan^{-1} x^2 + 1 + \log\left(x^2 + 1\right) + c$

Answer: B

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18. Integral of $\int \frac{dx}{\sin x + \sqrt{3}\cos x}$ is equal to

A. $\log \tan\left(\frac{x}{2} + \frac{\pi}{2}\right) + c$

B. $\frac{1}{2}\log \tan\left(\frac{x}{2} + \frac{\pi}{6}\right) + c$

C. $\frac{1}{2}\log \cot\left(\frac{x}{2} + \frac{\pi}{6}\right) + c$

D. $\frac{1}{2}\log \cot\left(\frac{x}{2} + \frac{\pi}{6}\right) + c$

Answer: B

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19. $\int \frac{dx}{4\cos^3 2x - 3\cos 2x}$ is equal to

A. $\frac{1}{3}\log + \sec 6x + \tan 6x \mid + c$

B. $\frac{1}{6}\log|\sec 6x + \tan 6x| + c$

C. $\log + \sec 6x + \tan 6x \mid + c$

D. None of these

Answer: B

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20. $\int \frac{\sin 3x}{\sin x} dx$ is equal to

A. $x + \sin 2x + c$

B. $3x + \sin 2x + c$

C. $3x + \sin^2 x + c$

D. None of these

Answer: A

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21. If $\int \frac{f(x)}{\log \sin x} dx = \log \log \sin x$, Then f(x) is equal to

A. $\sin x$

B. $\cos x$

C. $\log \sin x$

D. $\cot x$

Answer: D

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22. $\int \frac{In(x+1) - Inx}{x(x+1)} dx$ is equal to (where C is an arbitrary constant)

A. $-\frac{1}{2}\left[In\left(\frac{x+1}{x}\right)\right]^2 + C$

B. $C - \left[\{In(x+1)\}^2 - (Inx)^2\right]$

C. $In\left[In\left(\frac{x+1}{x}\right)\right] + C$

D. $-In\left(\frac{x+1}{x}\right) + C$

Answer: A

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23. If $\int \frac{1}{(1+x)\sqrt{x}} dx = f(x) + A$ where A is any arbitrary constant then the function f(x) is

A. $2\tan^{-1} x$

B. $2\tan^{-1} \sqrt{x}$

C. $2\cot^{-1} \sqrt{x}$

D. $\log_e (1+x)$

Answer: B

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24. $\int \sin^4 x dx = ax + b\sin 2x + c\sin 4x + d$ then $8a + 4b + 32c$ is equal to

A. 0

B. 1

C. 2

D. 3

Answer: D

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25. $\int \frac{dx}{(x-1)^{3/4}(x+2)^{5/4}} = k\left(\frac{x-1}{x+2}\right)^{1/4} + c.$

Find number of divisiors of 30k.

A. 2

B. 8

C. 6

D. 5

Answer: B

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26. If $\int \frac{\log\left(t+\sqrt{1+t^2}\right)}{\sqrt{1+t^2}}dt = \frac{1}{2}(g(t))^2 + c,$

where c is a constant, then g(2) is equal to

A. $\frac{1}{\sqrt{5}}\log\left(2+\sqrt{5}\right)$

B. $2\log\left(2+\sqrt{5}\right)$

C. $\log\left(2+\sqrt{5}\right)$

D. $\frac{1}{2}\log\left(2+\sqrt{5}\right)$

Answer: C

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27. If $I = \int \frac{dx}{x\sqrt{1-x^3}}$, then I equals to

A. $\frac{1}{3}\log\left|\frac{\sqrt{1-x^3}-1}{\sqrt{1-x^3}+1}\right| + C$

B. $\frac{1}{3}\log\left|\frac{\sqrt{1-x^3}+1}{\sqrt{1-x^3}-1}\right| + C$

C. $\frac{2}{3}\log\left|1-x^3\right| + C$

D. $\frac{1}{3}\log\left|x^{\frac{3}{2}} + \sqrt{1-x^3}\right| + C$

Answer: A

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28. Let $f(0) = f'(0) = 0$ and $f''(x) = \sec^4 x + 4$, then f(x) is equal to

A. $\frac{2}{3}\log|\sec| + \frac{1}{6}\tan^2 x + 2x^2$

B. $\frac{2}{3}\log|\cos x| + \frac{1}{6}an^2 x + 2x^2$

C. $\frac{2}{3}\log|\sec x| + \frac{1}{6}\tan^2 x$

D. None of these

Answer: A

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29. The valueof $\int \frac{\cos x}{\sin^2 x(\sin x + \cos x)} dx$ is equal to

A. $\log\left|\frac{1+\tan x}{\tan x}\right| - \cot x + C$

B. $\log\left|\frac{\tan x}{1+\tan x}\right| + C$

C. $\log\left|\frac{\tan x}{1+\tan x}\right| - \tan x + C$

D. $\log\left|\frac{\tan x}{1+\tan x}\right| + \cot x + C$

Answer: A

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30. $\int \frac{dx}{\sin x + \cos x + \sqrt{2}}$ is equal to

A. $-\frac{1}{\sqrt{2}}\tan\left(\frac{x}{2}\right) + \left(\frac{\pi}{8}\right) + C$

B. $\frac{1}{\sqrt{2}}\tan\left(\frac{x}{2} + \frac{\pi}{8}\right) + C$

C. $\frac{1}{\sqrt{2}}\cot\left(\frac{x}{2} + \frac{\pi}{8}\right) + C$

D. $-\frac{1}{\sqrt{2}}\cot\left(\frac{x}{2} + \frac{\pi}{8}\right) + C$

Answer: D

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