MATHS

BOOKS - RESONANCE DPP ENGLISH

INTEGRALS

Others

1. Evaluate $\int \frac{e^{3x} + e^{5x}}{e^{x} + e^{-x}} dx$

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2. $\int_a^4 \{x\}^{[x]} dx$ is equal to (where [.] and {.} represent greatest integer function and fractional part function respectively. $\frac{13}{12}$ (b) $\frac{1}{12}$ (c) $\frac{5}{12}$ (d) $\frac{17}{12}$

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3. The value of $\int_0^2 [x + [x + [x]]] dx$ (where, [.] denotes the greatest integer function)is equal to

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4. If $I_n = \int (\sin x)^n dx, n \in N,$ then $5I_4 - 6I_6$ is equal to :

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5. If $I_m = \int_1^e (\ln x)^m dx, m \in N,$ then $I_{10} + 10I_9$ is equal to (A) e^{10} (B) $\frac{e^{10}}{10}$ (C) e (D) $e - 1$

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6. $\int \frac{xdx}{\sqrt{1 + x^2 + \sqrt{(1 + x^2)^3}}}$ is equal to

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7. The value of $\int_{-2\pi}^{5\pi} \cot^{-1}(\tan x)dx$ is equal to

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8. $\int \frac{\left(1+(\log)_e x\right)^2}{1+(\log)_e x^{x+1}+\left((\log)_e x^{\sqrt{x}}\right)^2} dx =$

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9. $\int \sqrt{1+2\cot x(\cot x+\cos ecx)} dx$ is equal to (A) $2In\left(\frac{\cos x}{2}\right)+c$ (B) $2\ln\left(s\in\frac{x}{2}\right)+c$ (C) $\frac{1}{2}\ln\left(\frac{\cos x}{2}\right)+c$ (D) $\frac{1}{2}\ln\left(s\in\frac{x}{2}\right)+c$

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10. $\int_0^{\pi} \sin^3\theta(1+2\cos\theta)(1+\cos\theta)^2 d\theta$ is equal to (a) $\frac{1}{3}$ (b) $\frac{8}{3}$ (c) $\frac{3}{2}$ (d) None of these

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11. If $U_n = \int_0^1 x^n (2-x)^n dx$ and $V_n = \int_0^1 x^n (1-x)^n dx n \varepsilon N.$

Then prove that $U_n = 2^{2n}. V_n.$

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12. $\int \frac{x+2}{(x^2+3x+3)\sqrt{x+1}} dx$ is equal to $\frac{1}{3}\tan^{-1}\left(\frac{x}{\sqrt{3(x+1)}}\right)$ (b) $\frac{2}{\sqrt{3}}\tan^{-1}\left(\frac{x}{\sqrt{3(x+1)}}\right)$ $\frac{2}{\sqrt{3}}\tan^{-1}\left(\frac{x}{\sqrt{x+1}}\right)$ (d) none of these

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13. $\int \frac{\cos^3 x}{\sqrt{\sin^7 x}} dx =$

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14. Evaluate $\int_0^9 \{\sqrt{x}\} dx$, where $\{x\}$ denotes the fractional part of x

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15. The value of $\int_{-\left(\frac{\pi}{4}\right)^{\frac{1}{3}}}^{\left(\frac{\pi}{4}\right)^{\frac{1}{3}}} \frac{x^2}{\left(1+\sin^2 x^3\right)\left(1+e^{x^7}\right)} dx is$ (a) $\frac{1}{3}\tan^{-1}\sqrt{2}$ (b) $\frac{1}{3\sqrt{2}}\tan^{-1}\sqrt{2}$ (c) $\int_0^{\frac{\pi}{4}} \frac{\sec^2 dx}{\sec^2 x + \tan^2 x}$ (d) $\frac{1}{3}\int_0^{\frac{\pi}{4}} \frac{\sec^2 x dx}{\sec^2 x + \tan^2 x}$

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16. If $\int_0^1 \tan^{-1} x dx = \alpha, then \int_0^{\frac{\pi}{4}} \tan^{-1}\left(\frac{2\cos^2\theta}{2-\sin 2\theta}\right)\sec^2\theta dthn$ is equal to: α (b) $\frac{\alpha}{2}$ (c) 3α (d) 2α

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17. If f is a function with period P, then $\int_a^{a+p} f(x)dx$ is equal to $f(a)$ (b) equal to $f(p)$ independent of a (d) None of these

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18. The value of $\int_1^{e^{37}} \frac{\pi \sin(\pi Inx)}{x} dx$ is (a) 2 (b) 4 (c) e^{27} (d) e^{37}

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19. $\int \frac{\left(x^{-7/6} - x^{5/6}\right) dx}{x^{1/3}(x^2+x+1)^{1/2} - x^{1/2}(x^2+x+1)^{1/3}}$

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20. $\int_{-1}^{1} \frac{x^3|x| + 1}{x^2 + 2|x| + 1} dx = a \ln 2 + b then\ a = 2; b = 1$ (b) $a = 2; b = 0\ a = 2; b = -2$ (d) $a = 4; b = -1$

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21. $\int\left(\left(\frac{x}{e}\right)^x+\left(\frac{e}{x}\right)^x\right)Inxdx=$ (a) $\left(\frac{e}{x}\right)^x-\left(\frac{x}{e}\right)^x+c$ (b) $\left(\frac{x}{e}\right)^x+\left(\frac{e}{x}\right)^x+c$ (c) $\left(\frac{x}{e}\right)^x-\left(\frac{e}{x}\right)^x+c$ (d) None of these

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22. Let $A=\int_0^1\frac{e^t}{t+1}dt$, then the value of $\frac{\int_0^1 te^t\hat{}2}{t^2+1}dt$ A^2 (b) $\frac{1}{2}A$ (c) $2A$ (d) $\frac{1}{2}A^2$

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