DPP
DAILY PRACTICE PROBLEMS

CLASS : XIIth **SUBJECT : MATHS**
DATE : **DPP NO. : 10**

Topic :-INTEGRALS

1. The value of $\int_{-\pi/2}^{\pi/2}(x^3 + x\cos x + \tan^5 x + 1)dx$is equal to

   a) 0 b) 2 c) π d) None of these

2. If a function $f(x)$ satisfies $f'(x) = g(x)$Then, the value of $\int_a^b f(x)g(x)dx$is

   a) $\frac{1}{2}[(f(b))^2 - (F(a))^2]$ b) $\frac{1}{2}[(f(b))^2 + (f(a))^2]$ c) $\frac{1}{2}[f(b) - f(a)]^2$ d) None of these

3. If $\int \frac{4e^x + 6e^{-x}}{9e^x - 4e^{-x}}dx = Ax + B\log(9e^{2x} - 4) + C$, then

   a) $A = -\frac{3}{2}, B = \frac{35}{36}, C = 0$

   b) $A = \frac{35}{36}, B = -\frac{3}{2}, C \in R$

   c) $A = -\frac{3}{2}, B = \frac{35}{36}, C \in R$

   d) None of these

4. If $\int \frac{\cos 4x + 1}{\cot x - \tan x}dx = k\cos 4x + c$, then

   a) $k = -1/2$ b) $k = -1/8$ c) $k = -1/4$ d) None of these

5. The value of $\int_{-2}^{4}|x + 1|dx$ is equal to

   a) 12 b) 14 c) 13 d) 16

6. $\int_2^3 \frac{dx}{x^2 - x}$ is equal to

   a) $\log\left(\frac{2}{3}\right)$ b) $\log\left(\frac{1}{4}\right)$ c) $\log\left(\frac{4}{3}\right)$ d) $\log\left(\frac{8}{3}\right)$

7. The value of $\int \frac{x^2 + 1}{x^4 - x^2 + 1}dx$ is

   a) $\tan^{-1}(2x^2 - 1) + c$ b) $\tan^{-1}\frac{x^2 + 1}{x} + c$ c) $\sin^{-1}\left(x - \frac{1}{x}\right) + c$ d) $\tan^{-1}\left(\frac{x^2 - 1}{x}\right) + c$

8. $\int \frac{1+\tan x}{e^{-x}\cos x}\,dx$ is equal to

a) $e^{-x}\tan x + c$ b) $e^{-x}\sec x + c$ c) $e^{x}\sec x + c$ d) $e^{x}\tan x + c$

9. If $f(x) = \int_{x^2}^{x^2+1} e^{-t^2}dt$, then $f(x)$ increases in

a) $(2, 2)$ b) No value of x c) $(0, \infty)$ d) $(-\infty, 0)$

10. $\int \frac{x^2-1}{(x^2+1)\sqrt{x^4+1}}\,dx$ is equal to

a) $\sec^{-1}\left(\frac{x^2+1}{x\sqrt{2}}\right) + c$ b) $\frac{1}{2}\sec^{-1}\left(\frac{x^2+1}{\sqrt{2}}\right) + c$ c) $\frac{1}{2}\sec^{-1}\left(\frac{x^2+1}{x\sqrt{2}}\right) + c$ d) None of these

11. If $\left(\int_0^a x\,dx\right) \leq (a+4)$, then

a) $0 \leq a \leq 4$ b) $-2 \leq a \leq 4$ c) $-2 \leq a \leq 0$ d) $a \leq -2$ or $a \geq 4$

12. If $u_n = \int_0^{\pi/4} \tan^n x\,dx$, then $u_n + u_{n-2}$ is equal to

a) $\frac{1}{n-1}$ b) $\frac{1}{n+1}$ c) $\frac{1}{2n-1}$ d) $\frac{1}{2n+1}$

13. $\int_0^{\pi} x\sin^4 x\,dx$ is equal to

a) $\frac{3\pi}{16}$ b) $\frac{3\pi^2}{16}$ c) $\frac{16\pi}{3}$ d) $\frac{16\pi^2}{3}$

14. $\int \frac{\sin x - \cos x}{\sqrt{1-\sin 2x}} e^{\sin x}\cos x\,dx$ is equal to

a) $e^{\sin x} + C$ b) $e^{\sin x - \cos x} + C$ c) $e^{\sin x + \cos x} + C$ d) $e^{\cos x - \sin x} + C$

15. The value of $\int \frac{dx}{\sqrt{x}+\sqrt[3]{x}}$ is

a) $3\sqrt{x} + 3(\sqrt[3]{x}) - 6\sqrt[6]{x} + 6\log\left(\sqrt[6]{x+1}\right) + c$ b) $2\sqrt{x} + 6(\sqrt[6]{x}) - 6\log\left(\sqrt[6]{x+1}\right) + c$

c) $2\sqrt{x} - 3(\sqrt[3]{x}) + 6(\sqrt[6]{x}) - 6\log\left(\sqrt[6]{x+1}\right) + c$ d) None of the above

16. $\int \sqrt[3]{x^7}\sqrt{1+\sqrt[3]{x^4}}dx$ is equal to

a) $\frac{21}{32}\left\{1+\sqrt[3]{x^4}\right\}^{8/7} + C$ b) $\frac{32}{21}\left\{1+\sqrt[3]{x^4}\right\}^{8/7} + C$ c) $\frac{7}{32}\left\{1+\sqrt[3]{x^4}\right\}^{8/7} + C$ d) None of these

17. If $\int \sin^{-1}\left(\frac{2x}{1+x^2}\right)dx = f(x) - \log(1+x^2) + c$, then $f(x)$ is equal to

a) $2x\tan^{-1}x$ b) $-2x\tan^{-1}x$ c) $x\tan^{-1}x$ d) $-x\tan^{-1}x$

18. If $I_{10} = \int_0^{\pi/2} x^{10}\sin x\,dx$. Then, the value of $I_{10} + 90I_8$ is

a) $10\left(\frac{\pi}{2}\right)^3$ b) $10\left(\frac{\pi}{2}\right)^9$ c) $\frac{\pi}{2}$ d) 0

19. $\int_0^{\pi} \frac{x\,dx}{a^2\cos^2 x + b^2\sin^2 x}$ is equal to

a) $\frac{\pi}{ab}$ b) $\frac{\pi}{2ab}$ c) $\frac{\pi^2}{ab}$ d) $\frac{\pi^2}{2ab}$

20. Let $f(x) = x - [x]$, for every real x, where $[x]$is the greatest integer less than or equal to x. Then, $\int_{-1}^{1} f(x)dx$is

a) 1 b) 2 c) 3 d) 0