DPP
DAILY PRACTICE PROBLEMS

CLASS : XIIth **SUBJECT : MATHS**
DATE : **DPP NO. : 2**

Topic :-INTEGRALS

1. The value of the integral $\int_0^{\pi} \log(1+\cos x)\,dx$ is
   a) $\frac{\pi}{2}\log 2$ b) $-\pi \log 2$ c) $\pi \log 2$ d) None of these

2. $\int e^{\tan^{-1}x}\left(\frac{1+x+x^2}{1+x^2}\right)dx$ is equal to
   a) $x\,e^{\tan^{-1}x}+C$ b) $x^2 e^{\tan^{-1}x}+C$ c) $\frac{1}{x}e^{\tan^{-1}x}+C$ d) None of these

3. Let $I_1=\int_a^{\pi-a} xf(\sin x)\,dx, I_2=\int_a^{\pi-a} f(\sin x)\,dx$, then I_2 is equal to
   a) $\frac{\pi}{2}I_1$ b) πI_1 c) $\frac{2}{\pi}I_1$ d) $2I_1$

4. $\int \cos^{-1}\left(\frac{1}{x}\right)dx$equals
   a) $x\sec^{-1}x+\cosh^{-1}x+c$ b) $x\sec^{-1}x-\cosh^{-1}x+c$
   c) $x\sec^{-1}x-\sin^{-1}x+c$ d) None of these

5. The value of $\int_0^1 \frac{dx}{x+\sqrt{1-x^2}}$ is
   a) $\frac{\pi}{3}$ b) $\frac{\pi}{2}$ c) $\frac{1}{2}$ d) $\frac{\pi}{4}$

6. For any natural number n, the value of the integral $\int_0^{\sqrt{n}}[x^2]dx$, is
   a) $n\sqrt{n}+\sum_{r=1}^{n}\sqrt{r}$ b) $n\sqrt{n}-\sum_{r=1}^{n}\sqrt{r}$ c) $\sum_{r=1}^{n}\sqrt{r}-n\sqrt{n}$ d) None of these

7. $\int \frac{1}{x}(\log_{ex} e)dx$ is equal to
   a) $\log_e(1-\log_e x)+c$ b) $\log_e(\log_e ex-1)+c$
   c) $\log_e(\log_e x-1)+c$ d) $\log_e(1+\log_e x)+c$

8. Let f be integrable over $[0,a]$ for any real a.If we define
$I_1=\int_0^{\pi/2}\cos\theta f(\sin\theta+\cos^2\theta)\,d\theta$
and$I_2=\int_0^{\pi/2}\sin 2\theta f(\sin\theta+\cos^2\theta)\,d\theta$, then
   a) $I_1=I_2$ b) $I_1=-I_2$ c) $I_1=2I_2$ d) $I_1=-2I_2$

9. Consider the following statements:
1.$\int_{-\pi/2}^{\pi/2}\sqrt{\cos x-\cos^3 x}\;dx=\frac{3}{4}$
2.$\int_0^4(|x-1|+|x-3|)dx=10$
Which of these is/are correct?

a) Only (1) b) Only (2) c) Both of these d) None of these

10. The value of the integral $\int_{-\pi/4}^{\pi/4} \sin^{-4} x \, dx$ is

a) $-\frac{8}{3}$ b) $\frac{3}{2}$ c) $\frac{8}{3}$ d) None of these

11. The value of $\lim_{x\to\infty} \frac{\left(\int_0^x e^x \, dx\right)^2}{\int_0^x e^{2x^3} \, dx}$, is

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

12. If $\int_{\sin x}^{1} t^2 f(t)dt = 1 - \sin x, \forall\, x \in [0, \pi/2]$, then $f\left(\frac{1}{\sqrt{3}}\right)$ is

a) 3 b) $\sqrt{3}$ c) $\frac{1}{3}$ d) None of these

13. If a is fixed real number such that $f(a-x) + f(a+x) = 0$, then $\int_0^{2a} f(x)\, dx =$

a) $\frac{a}{2}$ b) 0 c) $-\frac{a}{2}$ d) $2a$

14. $\int \frac{dx}{\sin(x-a)\sin(x-b)}$ is

a) $\frac{1}{\sin(a-b)} \log\left|\frac{\sin(x-a)}{\sin(x-b)}\right| + c$

b) $\frac{-1}{\sin(a-b)} \log\left|\frac{\sin(x-a)}{\sin(x-b)}\right| + c$

c) $\log \sin(x-a)\sin(x-b) + c$

d) $\log\left|\frac{\sin(x-a)}{\sin(x-b)}\right| + c$

15. Let $\int \sqrt{\frac{5-x}{2+x}} dx$ equal

a) $\sqrt{x+2}\sqrt{5-x} + 3\sin^{-1}\sqrt{\frac{x+2}{3}} + C$

b) $\sqrt{x+2}\sqrt{5-x} + 7\sin^{-1}\sqrt{\frac{x+2}{7}} + C$

c) $\sqrt{x+2}\sqrt{5-x} + 5\sin^{-1}\sqrt{\frac{x+2}{5}} + C$

d) None of these

16. $\int \frac{2x^2+3}{(x^2-1)(x^2+4)} dx = a\log\left(\frac{x+1}{x-1}\right) + b\tan^{-1}\frac{x}{2}$, then (a, b) is

a) $(-1/2, 1/2)$ b) $(1/2, 1/2)$ c) $(-1, 1)$ d) $(1, -1)$

17. $\int e^x \frac{(x-1)}{x^2}\, dx$ is equal to

a) $\frac{e^x}{x^2} + c$ b) $\frac{-e^x}{x^2} + c$ c) $\frac{e^x}{x} + c$ d) $\frac{-e^x}{x} + c$

18. The value of the integral $\int_0^{3\alpha} \text{cosec}(x-\alpha)\text{cosec}(x-2\alpha)dx$, is

a) $2\sec\alpha \log\left(\frac{1}{2}\text{cosec}\,\alpha\right)$ b) $2\sec\alpha \log\left(\frac{1}{2}\sec\alpha\right)$ c) $2\,\text{cosec}\,\alpha \log(\sec\alpha)$ d) $2\,\text{cosec}\,\alpha \log\left(\frac{1}{2}\sec\alpha\right)$

19. $\int_0^3 \frac{3x+1}{x^2+9}\,dx$ is equal to

a) $\log(2\sqrt{2}) + \frac{\pi}{12}$ b) $\log(2\sqrt{2}) + \frac{\pi}{2}$ c) $\log(2\sqrt{2}) + \frac{\pi}{6}$ d) $\log(2\sqrt{2}) + \frac{\pi}{3}$

20. $\int \frac{dx}{\sqrt{(1-x)(x-2)}}$ is equal to

a) $\sin^{-1}(2x-3)+c$ b) $\sin^{-1}(2x+5)+c$ c) $\sin^{-1}(3-2x)+c$ d) $\sin^{-1}(5-2x)+c$