

**CLASS : XIIth
DATE :**

SUBJECT : MATHS

Topic :-INTEGRALS

1. $\int_1^e \frac{1}{x} dx$ is equal to
a) ∞ b) 0 c) 1 d) $\log(1 + e)$

2. $\lim_{n \rightarrow \infty} \frac{1^{99} + 2^{99} + \dots + n^{99}}{n^{100}} =$
a) $\frac{99}{100}$ b) $\frac{1}{100}$ c) $\frac{1}{99}$ d) $\frac{1}{101}$

3. $\int \frac{\cos 2x}{\cos x} dx$ is equal to
a) $2\sin x + \log(\sec x - \tan x) + C$
b) $2\sin x - \log(\sec x - \tan x) + C$
c) $2\sin x + \log(\sec x + \tan x) + C$
d) None of these

4. $\int f'(ax + b)\{f(ax + b)\}^n dx$ is equal to
a) $\frac{1}{n+1}\{f(ax + b)\}^{n+1} + C$, for all n except $n = -1$
b) $\frac{1}{n+1}\{f(ax + b)\}^{n+1} + C$, for all n
c) $\frac{1}{a(n+1)}\{f(ax + b)\}^{n+1} + C$, for all n except $n = -1$
d) $\frac{1}{a(n+1)}\{f(ax + b)\}^{n+1} + C$, for all n

5. If $I_1 = \int_0^1 2^{x^2} dx$, $I_2 = \int_0^1 2^{x^3} dx$, $I_3 = \int_1^2 2^{x^2} dx$ and $I_4 = \int_1^2 2^{x^3} dx$, then
a) $I_3 > I_4$ b) $I_3 = I_4$ c) $I_1 > I_2$ d) $I_2 > I_1$

6. $\int \frac{\sqrt{\tan x}}{\sin x \cos x} dx = \dots + c$; $x \neq \frac{k\pi}{2}$ and $\tan x > 0$
a) $\frac{1}{2\sqrt{\tan x}}$ b) $\sqrt{2 \tan x}$ c) $2\sqrt{\tan x}$ d) $\sqrt{\tan x}$

7. $\lim_{n \rightarrow \infty} \frac{1}{n} \sum_{r=1}^{2n} \frac{r}{\sqrt{n^2 + r^2}}$ equals
a) $1 + \sqrt{5}$ b) $-1 + \sqrt{5}$ c) $-1 + \sqrt{2}$ d) $1 + \sqrt{2}$

8. $\int_0^\infty \frac{x \log x \, dx}{(1 + x^2)^2}$ is equal to

- a) 0 b) 1 c) ∞ d) None of these

9. The value of $\int_{-1}^1 [x[1 + \sin \pi x]] dx$ is ([·] denotes the greatest integer)
 a) 2 b) 0 c) 1 d) None of these

10. If $\int_0^\infty e^{-x^2} dx = \sqrt{\frac{\pi}{2}}$ then $\int_0^\infty e^{-ax^2} dx, a > 0$ is
 a) $\frac{\sqrt{\pi}}{2}$ b) $\frac{\sqrt{\pi}}{2a}$ c) $2\frac{\sqrt{\pi}}{a}$ d) $\frac{1}{2}\frac{\sqrt{\pi}}{a}$

11. If $\int \frac{2^x}{\sqrt{1 - 4^x}} dx = K \sin^{-1}(2^x) + C$, then K is equal to
 a) $\log 2$ b) $\frac{1}{2}\log 2$ c) $\frac{1}{2}$ d) $\frac{1}{\log 2}$

12. The value of the integral $\int_{-\pi}^{\pi} (\cos ax - \sin bx)^2 dx$, where (a and b integers), is
 a) $-\pi$ b) 0 c) π d) 2π

13. $\int \frac{mx^{m+2n-1} - nx^{n-1}}{x^{2m+2n} + 2x^{m+n} + 1} dx$ is equal to
 a) $\frac{x^m}{x^{m+n} + 1} + C$ b) $\frac{x^n}{x^{m+n} + 1} + C$ c) $\frac{x^{m+n} - 1}{x^{m+n} + 1} + C$ d) $-\frac{x^n}{x^{m+n} + 1} + C$

14. The value of $\int_0^{16\pi/3} |\sin x| dx$, is
 a) 21 b) 21/2 c) 10 d) 11

15. If $f(x)$ and $g(x)$, $x \in R$ are continuous functions, then value of integral
 $\int_{-\pi/2}^{\pi/2} [(f(x) + f(-x))(g(x) - g(-x))] dx$ is
 a) π b) $\frac{\pi}{2}$ c) 1 d) 0

16. $\int \frac{\sqrt{\tan x}}{\sin x \cos x} dx$ is equal to
 a) $2\sqrt{\tan x} + C$ b) $2\sqrt{\cot x} + C$ c) $\frac{\sqrt{\tan x}}{2} + C$ d) None of these

17. $\int_0^1 \sin \left\{ 2 \tan^{-1} \sqrt{\frac{1+x}{1-x}} \right\} dx =$
 a) $\pi/6$ b) $\pi/4$ c) $\pi/2$ d) π

18. If $\int_{-\pi/3}^{\pi/3} \left(\frac{a}{3} |\tan x| + \frac{b \tan x}{1 + \sec x} \right) dx = 0$ where a, b, c are constants, then $c =$
 a) $a \ln 2$ b) $\frac{a}{\pi} \ln 2$ c) $-\frac{a}{\pi} \ln 2$ d) $\frac{2a}{\pi} \ln 2$

19. If the tangent to the graph function $y = f(x)$ makes angles $\frac{\pi}{4}$ and $\frac{\pi}{3}$ with the x -axis
 the point $x = 2$ and $x = 4$ respectively, the value of $\int_2^4 f'(x)f''(x) dx$
 a) $f(4)f(2)$ b) $f(4)$ c) $f(2)$ d) 1

s20. $\int \frac{dx}{\cos^3 \sqrt{2} \sin 2x}$ is equal to

- a) $\sqrt{\tan x} + \frac{\tan^{5/2} x}{5} + c$
- b) $\sqrt{\tan x} + \frac{2}{5} \tan^{5/2} x + c$
- c) $2\sqrt{\tan x} + \frac{2}{5} \tan^{5/2} x + c$
- d) None of these

