

Model Questions for Integral Calculus.

MCS

1) The integral for $\int \frac{dx}{\sqrt{x}}$ is:-

- (a) \sqrt{x} (b) $2\sqrt{x}$ (c) $x^{3/2}$ (d) $\frac{2}{3}x^{3/2}$

2) The integral for $\int a^x dx$ is:-

- (a) $\int e^{x \log a} dx$ (b) $\frac{e^{x \log a}}{\log a}$ (c) $\frac{a^x}{\log a}$

(d) All of the above.

3) The integral for $\int \sec x dx$ is

- (a) $\log(\sec x + \tan x)$ (b) $\log \tan\left(\frac{\pi}{4} + \frac{x}{2}\right)$ (c) Both a & b
(d) None of these

4) The integral for $\int \frac{dx}{\sqrt{a^2 - x^2}}$ is

- (a) $\sin^{-1}(x/a)$ (b) $\cos^{-1}(x/a)$ (c) Both 'a' & 'b'
(d) None of these.

5) The integral for $\int \frac{dx}{x^2 - a^2}$ is

- (a) $\frac{1}{2a} \log\left(\frac{x-a}{x+a}\right)$ (b) $\frac{1}{2a} \log \frac{a+x}{a-x}$ (c) $\frac{1}{a} \sec^{-1} \frac{x}{a}$

(d) None of these.

6) The integral for $\int \frac{dx}{a^2 + x^2}$ is:

- (a) $\tan^{-1} \frac{x}{a}$ (b) $\frac{1}{a} \tan^{-1} \frac{x}{a}$ (c) $\frac{1}{a} \sec^{-1} \frac{x}{a}$ (d) $\sec^{-1} \frac{x}{a}$

7) The integral for $\int \sqrt{x^2 - a^2} dx$

- (a) $\frac{x\sqrt{x^2 - a^2}}{2} + \frac{a^2}{2} \log(x + \sqrt{x^2 - a^2})$ (c) $\frac{x\sqrt{x^2 - a^2}}{2} - \frac{a^2}{2} \log(x + \sqrt{x^2 - a^2})$

- (b) $\frac{x\sqrt{a^2 - x^2}}{2} + \frac{a^2}{2} \sin^{-1} \frac{x}{a}$

(d) None of these.

8) The integral of $\int \frac{dx}{\sqrt{x^2-a^2}}$ is :-

- (a) $\log(x + \sqrt{x^2-a^2})$ (b) $\log(x + \sqrt{x^2+a^2})$
(c) $\log(x - \sqrt{x^2-a^2})$ (d) $\log(x - \sqrt{x^2+a^2})$

9) The integral of $\int \operatorname{cosec} x \, dx$ is :

- a) $\log \cot(x/2)$ (b) $\cot(x/2)$ (c) $\log \tan(x/2)$ (d) $\tan(x/2)$

10) The integral of $\int \tan x \, dx$ is :

- (a) $\log \sec x$ (b) $\log \operatorname{cosec} x$ (c) $\log \sin x$ (d) $\log \cos x$

Short Answer type Questions

1) Evaluate $\int \sin^4 x \, dx$.

2) Evaluate $\int \sin x \sin 2x \sin 3x \, dx$

3) Evaluate $\int \frac{\sin x \, dx}{\sqrt{1+\sin x}}$

4) Evaluate $\int \sec^3 x \, dx$.

Long Answer type Question

1) Evaluate (a) $\int \tan^{-1} \sqrt{\frac{1-x}{1+x}} \, dx$ (b) $\int \sin^{-1} \sqrt{\frac{x}{a+x}} \, dx$

2) Evaluate (a) $\int \left\{ \frac{1}{\log x} - \frac{1}{(\log x)^2} \right\} dx$

(b) $\int \frac{e^{m \tan^{-1} x}}{(1+x^2)^2} \, dx$