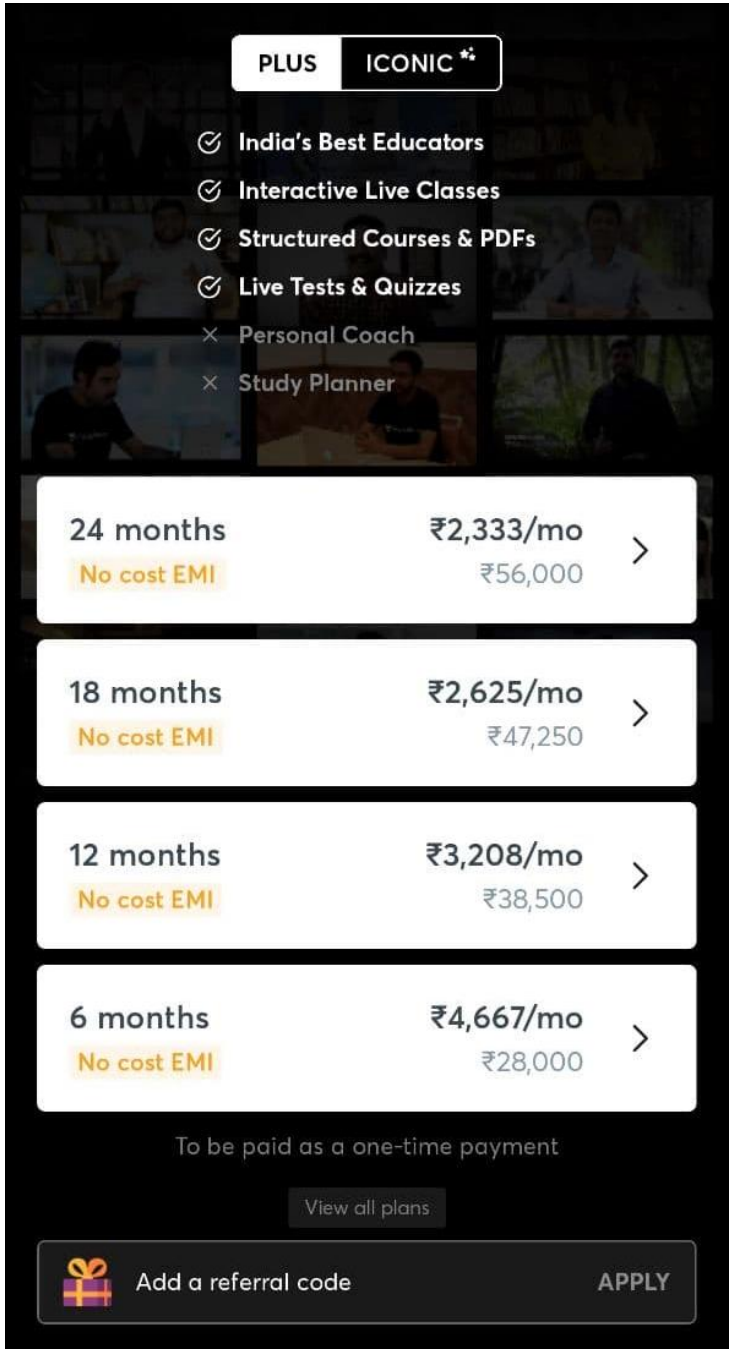
"आज PHYSICS में मचाते हैं।"

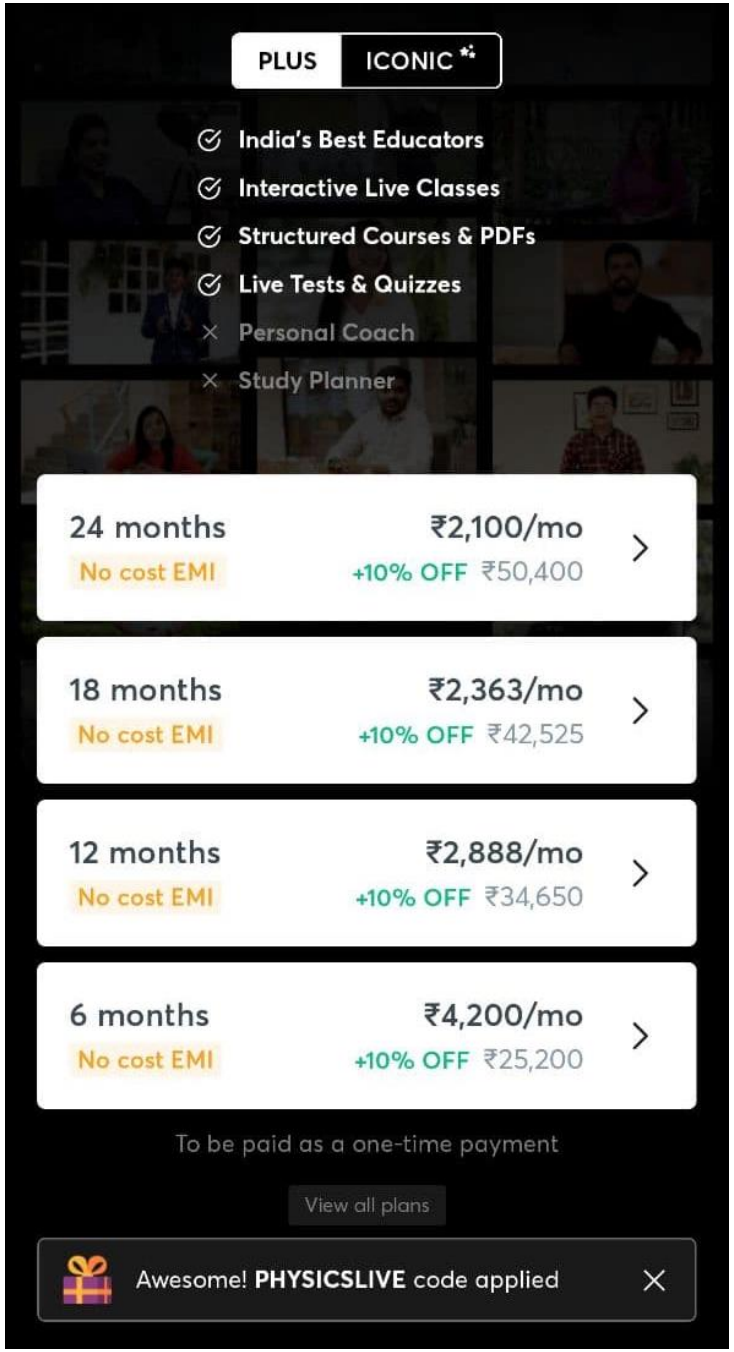
# SIR PRATEEK JAIN

. IIT JEE & NEET FACULTY ( KOTA)
. TOP PHYSICS FACULTY ON UNACADEMY.
. 8+ YEARS OF TEACHING EXPERIENCE
. RESEARCH WORK WITH HC VERMA SIR AT IIT KANPUR
. PRODUCED RANKS LIKE AIR 6, AIR 10 ETC.




# PHYSICSLIVE

Use code PHYSICSLIVE to get 10% OFF on Unacademy PLUS.



# For Video Solution of this DPP, Click on below link

Solution on Website:- https://physicsaholics.com/home/courseDetails/36

Solution on YouTube:- https://youtu.be/7smFzaTLc9E

unacademy

# IIT JEE
# Physics DPP

## DPP-7 Basic Maths: Indefinite Integration

By Physicsaholics Team

unacademy

Q) Find $\int x\,dx = ?$

(a) $\frac{x^2}{2} + C$ (b) $x^2 + C$ (c) $x^2 + x + C$ (d) $C$

Ans. a

$$I = \int x \, dx$$

$$I = \frac{x^{1+1}}{1+1} + c$$

$$\boxed{I = \frac{x^2}{2} + c}$$

unacademy

Q) Find $\int \frac{1}{x} dx = ?$

(a) $\frac{x^2}{2} + C$

(b) $\frac{1}{x^2} + C$

(c) $\ln x + C$

(d) None of these

Ans. c

$$I = \int \frac{1}{x}\, dx$$

$$\because \frac{d}{dx}(\ln x) = \frac{1}{x}$$

$$\therefore \boxed{\int \frac{1}{x}\, dx = \ln(x) + c}$$

Q) Find $\int(4x^2+1)dx$ =?

(a) $x^4+x+C$

(b) $\frac{4x^3}{3}+x+C$

(c) $8x+C$

(d) None of these

Ans. b

$$I = \int (4x^2 + 1)\, dx$$

$$I = \int 4x^2\, dx + \int dx$$

$$I = 4\int x^2\, dx + \int dx$$

$$\boxed{I = \frac{4}{3}x^3 + x + C}$$

unacademy

Q) Find $\int 3e^{3x}\,dx = ?$

(a) $3e^{3x} + C$

(b) $e^{3x} + C$

(c) $\frac{3e^{4x}}{4} + C$

(d) None of these

Ans. b

$$I = \int 3 e^{3x} dx$$

$$\therefore \int e^{ax} = \frac{1}{a} e^{ax} + c$$

$$\therefore I = 3 \int e^{3x} dx$$

$$I = 3 \frac{e^{3x}}{3} + c$$

$$\boxed{I = e^{3x} + c}$$

unacademy

Q) Find $\int \left(e^x + \frac{2}{x}\right) dx = ?$

(a) $e^{2x} + \ln 2x + C$

(b) $\frac{e^{2x}}{2} + 2\ln 2x + C$

(c) $e^x + 2\ln x + C$

(d) None of these

Ans. c

$$I = \int \left(e^x + \frac{2}{x}\right) dx$$

$$I = \int e^x dx + 2\int \frac{1}{x} dx$$

$$\boxed{I = e^x + 2\ln(x) + c}$$

Q) If $y = (3x + 1)^3$, then find $I = \int y\, dx$ ?

(a) $I = \frac{(3x+1)^4}{4} + C$

(b) $\frac{(3x+1)^4}{12} + C$

(c) $I = \frac{(3x+1)^4}{3} + C$

(d) None of these

Ans. b

$$I = \int (3x+1)^3$$

$$\therefore I = \int (ax+b)^n = \frac{(ax+b)^{n+1}}{a(n+1)} + c$$

$$\therefore I = \frac{(3x+1)^{(3+1)}}{3(3+1)} + c$$

$$\boxed{I = \frac{(3x+1)^4}{12} + c}$$

unacademy

Q) If $y = \sin x + \cos x$, then find $I = \int y\, dx$ ?

(a) $I = -\cos x - \sin x + c$ (b) $I = \cos x - \sin x + c$

(c) $I = -\cos x + \sin x + c$ (d) None of these

Ans. c

$$y = \sin x + \cos x$$

$$I = \int y \, dx$$

$$I = \int (\sin x + \cos x) \, dx$$

$$I = \int \sin x \, dx + \int \cos x \, dx$$

$$\boxed{I = -\cos x + \sin x + C}$$

Q) Find $I = \int \frac{1}{x^3}\, dx$ ?

(a) $I = -\frac{1}{2x^2} + c$

(b) $I = \frac{1}{2x^2} + c$

(c) $I = \frac{1}{x^2} + c$

(d) None of these

Ans. a

$$I = \int \frac{1}{x^3}\, dx$$

$$I = \int x^{-3}\, dx$$

$$I = \frac{x^{-3+1}}{-3+1} + C$$

$$I = \frac{x^{-2}}{-2} + C$$

$$I = -\frac{x^{-2}}{2} + C$$

$$\boxed{I = \frac{-1}{2x^2} + C}$$

Q) Find $I = \int (e^x + \cos x)\, dx$ ?

(a) $I = e^x - \sin x + c$

(b) $I = e^x + \sin x + c$

(c) $I = e^x - \cos x + c$

(d) None of these

Ans. b

$$I = \int (e^x + \cos x)\, dx$$

$$I = \int e^x\, dx + \int \cos x\, dx$$

$$\boxed{I = e^x + \sin x + C}$$

Q) Find $I = \int (4x^3 + 3x^2 + 2x + 1)\, dx$ ?

(a) $I = 12x^4 + 6x^3 + 2x^2 + x + c$

(b) $I = \frac{4}{3}x^4 + \frac{3}{2}x^3 + 2x^2 + x + c$

(c) $I = x^4 + x^3 + x^2 + x + c$

(d) None of these

Ans. c

$$I = \int (4x^3 + 3x^2 + 2x + 1)\, dx$$

$$I = 4\frac{x^4}{4} + 3\frac{x^3}{3} + 2\frac{x^2}{2} + x + C$$

$$\boxed{I = x^4 + x^3 + x^2 + x + C}$$

Q) Find $I = \int \left(6\sqrt[5]{x} + 5\sqrt[3]{x^2}\right) dx$ ?

(a) $I = 5x^{\frac{6}{5}} + 3x^{\frac{5}{3}} + c$

(b) $I = x^{\frac{6}{5}} + x^{\frac{5}{2}} + c$

(c) $I = 6x^{\frac{6}{5}} + 5x^{\frac{5}{2}} + c$

(d) None of these

Ans. a

$$I = \int (6\sqrt[5]{x} + 5\sqrt[3]{x^2})\,dx$$

$$I = \int \left(6(x)^{\frac{1}{5}} + 5(x^2)^{\frac{1}{3}}\right) dx$$

$$I = \int \left(6(x)^{\frac{1}{5}} + 5(x)^{\frac{2}{3}}\right) dx$$

$$I = \int 6(x)^{\frac{1}{5}}\,dx + \int 5(x)^{\frac{2}{3}}\,dx$$

$$I = 6\,\frac{x^{\frac{1}{5}+1}}{\frac{1}{5}+1} + 5\,\frac{x^{\frac{2}{3}+1}}{\frac{2}{3}+1} + C$$

$$I = 6\left(\frac{5}{6}\right)\left(x^{\frac{6}{5}}\right) + 5\left(\frac{3}{5}\right)\left(x^{\frac{5}{3}}\right) + C$$

$$I = 5(x)^{6/5} + 3(x)^{5/3} + C$$

$$\boxed{I = 5(x)^{6/5} + 3(x)^{5/3} + C}$$

Q) Find $I = \int (3x^2 + e^x + \sin x + 2)\, dx$ ?

(a) $I = 3x^3 + e^x + \cos x + 2x + c$

(b) $I = x^3 + e^x - \cos x + 2x + c$

(c) $I = x^3 + e^x + \cos x + 2x + c$

(d) None of these

Ans. b

$$I = \int (3x^2 + e^x + \sin x + 2)\, dx$$

$$I = 3\int x^2 dx + \int e^x dx + \int \sin x\, dx + \int 2\, dx$$

$$I = 3\left[\frac{x^3}{3}\right] + e^x + (-\cos x) + 2x + C$$

$$\boxed{I = x^3 + e^x - \cos x + 2x + C}$$

# For Video Solution of this DPP, Click on below link

Solution on Website:- https://physicsaholics.com/home/courseDetails/36

Solution on YouTube:- https://youtu.be/7smFzaTLc9E

Chalo Niklo