



RK VISION ACADEMY

NEET | IIT – JEE | FOUNDATION

CBSE PRACTICE PAPER (2024)

(Mathematics)

Grade : XII

Marks: 40

marks

Chapter: INTEGRAL Set-1

Time: 90

minutes

SECTION A

(This section comprises of Multiple-choice questions (MCQ) of 1 mark each.)

- $$\int \frac{x^3}{\sqrt{1-x^8}} dx =$$

(a) $\frac{1}{2} \sin^{-1}(x^4) + c$ (b) $\frac{1}{3} \sin^{-1}(x^4) + c$ (c) $\frac{1}{4} \sin^{-1}(x^4) + c$ (d) None of these
- $$\int \frac{1 + \tan x}{x + \log \sec x} dx =$$

(a) (b) (c) (d) None of these
- $$\int \frac{\cos 2x + x + 1}{x^2 + \sin 2x + 2x} dx =$$

(a) (b) (c) (d) None of these
- $$\int a^{3x+3} dx =$$

(a) $\frac{a^{3x+3}}{\log a} + c$ (b) $\frac{a^{3x+3}}{3 \log a} + c$ (c) $a^{3x+3} \log a + c$ (d) $3a^{3x+3} \log a + c$
- $$\int \sin^3 x \cdot \cos x dx =$$

(a) $\frac{\sin^4 x \cos^2 x}{8} + c$ (b) $\frac{\sin^4 x}{4} + c$ (c) $\frac{\sin^2 x}{2} + c$ (d) $4 \sin^4 x + c$
- $$\int e^{-x} \operatorname{cosec}^2(2e^{-x} + 5) dx =$$

(a) (b) $-\frac{1}{2} \cot(2e^{-x} + 5) + c$ (c) $2 \cot(2e^{-x} + 5) + c$ (d) $-2 \cot(2e^{-x} + 5) + c$
- $$\int 2x \cos^3 x^2 \sin x^2 dx =$$

(a) $-\frac{1}{4} \cos^4 x^2 + c$ (b) $\frac{1}{4} \cos^4 x^2 + c$ (c) $\cos^4 x^2 + c$ (d) None of these
- $$\int \sec^4 x \tan x dx =$$

(a) $\frac{1}{4} \sec^4 x + c$ (b) $4 \sec^4 x + c$ (c) $\frac{\sec^3 x}{3} + c$ (d) $3 \sec^3 x + c$
- $$\int \frac{\sec^2 x dx}{\sqrt{\tan^2 x + 4}} =$$

(a) (b) (c) (d) None of these

$\log [\tan x + \sqrt{\tan^2 x + 4}] + \frac{1}{2} \log [\tan x + \sqrt{\tan^2 x + 4}] + \log \left[\frac{1}{2} \tan x + \frac{1}{2} \sqrt{\tan^2 x + 4} \right]$
- $$\int \frac{2x \tan^{-1} x^2}{\sqrt{\tan^2 x^2 + 4}} dx =$$

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

SECTION B

(This section comprises of very short answer type-questions (VSA) of 2 marks each.)

11. $\int \frac{dx}{x^2 + 16} dx$

12. $\int_0^2 \sqrt{4 - x^2} dx$

13. $\int_{-1}^1 \sin^5 x \cos^4 x dx$

SECTION C

(This section comprises of short answer type questions (SA) of 3 marks each)

14. $\int \frac{x}{x^4 - 1} dx$

15. $\int_2^8 |x - 5| dx$

16. $\int \frac{2x^2 + 1}{x^2(x^2 + 1)} dx$

SECTION D

(This section comprises of long answer-type questions (LA) of 5 marks each)

17. $\int \frac{3x + 5}{x^3 - x^2 - x + 1} dx$

18. $\int_{-\frac{\pi}{4}}^{\frac{\pi}{4}} \log(\cos x + \sin x) dx$

19. Prove that $\int_0^{\pi} \frac{x}{1 + \cos \alpha \sin x} dx = \frac{\pi \alpha}{\sin \alpha}$