

Dear student following is an Easy level [● O O] test paper. Score of 24 Marks in 15 Minutes would be a satisfactory performance. Questions 1-10 (+3, -1). (All questions have only one option correct)

Q.1 The value of $\int_{-2}^2 (ax^3 + bx + c) dx$ depends on the-
 (A) Value of b (B) Value of c
 (C) Value of a (D) Value of a and b

Q.6 $\int_{-\pi/2}^{\pi/2} \log\left(\frac{2 - \sin\theta}{2 + \sin\theta}\right) d\theta$ is-
 (A) 0 (B) 1
 (C) 2 (D) None of these

Q.2 $\int_2^3 \frac{dx}{x^2 - x} =$
 (A) $\log\left(\frac{2}{3}\right)$ (B) $\log\left(\frac{1}{4}\right)$
 (C) $\log\left(\frac{4}{3}\right)$ (D) $\log\left(\frac{8}{3}\right)$

Q.7 $\int_1^{\sqrt{3}} \frac{dx}{1+x^2}$ will be equal to-
 (A) $\frac{\pi}{3}$ (B) $\frac{2\pi}{3}$
 (C) $\frac{\pi}{6}$ (D) $\frac{\pi}{12}$

Q.3 $\int_0^2 e^x \left(\frac{1}{x} - \frac{1}{x^2}\right) dx =$
 (A) $e \left(\frac{e}{2} - 1\right)$ (B) $e(e - 1)$
 (C) 0 (D) $\frac{e}{e-1}$

Q.8 $\int_{\pi/6}^{\pi/3} \frac{dx}{\sin 2x}$ is equal to-
 (A) $\frac{1}{2} \log(-1)$ (B) $\log(-1)$
 (C) $\log 3$ (D) $\log \sqrt{3}$

Q.4 $\int_0^{\pi/2} \frac{2^{\sin x}}{2^{\sin x} + 2^{\cos x}} dx =$
 (A) 2 (B) π (C) $\frac{\pi}{2}$ (D) $\frac{\pi}{4}$

Q.9 Let $f(x) = \int_0^x t \sin t dt$. Then $f'(x)$ is-
 (A) $\cos x + x \sin x$ (B) $x \sin x$
 (C) $x \cos x$ (D) None of these

Q.5 The value of $\int_0^{\pi/2} \cos x \cdot e^{\sin x} dx$ is-
 (A) 0 (B) 1
 (C) -1 (D) $e - 1$

Q.10 $\int_{-\pi/2}^{\pi/2} \sin x dx$ equals-
 (A) 0 (B) 1
 (C) -1 (D) 2



MATHEMATICS IIT JEE (SEPT. 5th WEEK CLASS TEST 1) (DEFINITE INTEGRATION) ANSWER KEY

Name : Roll No. :

	A	B	C	D	A	B	C	D	A	B	C	D
1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
									10	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

ANSWER KEY

Que.	1	2	3	4	5	6	7	8	9	10
Ans.	B	C	A	D	D	A	D	D	B	A

SOLUTIONS
Sol.1 (B)

Since $ax^3 + bx$ is an odd function

$$\therefore \int_{-2}^2 (ax^3 + bx) dx = 0$$

$$\therefore \text{given integral} = \int_{-2}^2 c dx = c|x|^2_{-2} = 4c$$

\therefore integral depends upon the value of c .

Sol.2 (C)

$$\int_2^3 \frac{dx}{x^2 - x}$$

$$= \int_2^3 \frac{dx}{\left(x - \frac{1}{2}\right)^2 - \left(\frac{1}{2}\right)^2} \left[\text{Type } \int \frac{dx}{x^2 - a^2} \right]$$

$$= \frac{1}{2 \cdot \frac{1}{2}} \left| \log \frac{x - \frac{1}{2} - \frac{1}{2}}{x - \frac{1}{2} + \frac{1}{2}} \right|_2^3$$

$$= \left| \log \frac{x-1}{x} \right|_2^3 = \log \frac{2}{3} - \log \frac{1}{2}$$

$$= \log \left(\frac{2}{3} \times \frac{2}{1} \right) = \log \left(\frac{4}{3} \right)$$

Sol.3 (A)

$$\int_1^2 e^x \left(\frac{1}{x} - \frac{1}{x^2} \right) dx$$

$$[\text{Type } \int e^x (f(x) + f'(x)) dx]$$

$$= \left| \frac{e^x}{x} \right|_1^2 = \frac{e^2}{2} - \frac{e^1}{1} = \frac{e^2}{2} - e$$

$$= e \left(\frac{e}{2} - 1 \right)$$

Sol.4 (D)

$$\text{Let } I = \int_0^{\pi/2} \frac{2^{\sin x}}{2^{\sin x} + 2^{\cos x}} dx = \frac{\pi}{4}$$

$$[\text{Using } \int_a^b f(x) dx = \int_a^b f(x - b - a) dx]$$

Sol.5 (D)

$$\int_0^{\pi/2} \cos x \cdot e^{\sin x} dx$$

$$[\text{Type } \int e^{f(x)} \cdot f'(x) dx]$$

$$= \left| e^{\sin x} \right|_0^{\pi/2}$$

$$= e^{\sin \frac{\pi}{2}} - e^0 = e^1 - 1 = e - 1$$

Sol.6 (A)

Since $\log \left(\frac{2 - \sin \theta}{2 + \sin \theta} \right)$ is an odd function of θ .

$$\therefore \int_{-\pi/2}^{\pi/2} \log \left(\frac{2 - \sin \theta}{2 + \sin \theta} \right) d\theta = 0$$

Sol.7 (D)

$$\int_1^{\sqrt{3}} \frac{dx}{1+x^2} = \left| \tan^{-1} x \right|_1^{\sqrt{3}}$$

$$= \tan^{-1} \sqrt{3} - \tan^{-1} 1$$

$$= \frac{\pi}{3} - \frac{\pi}{4} = \frac{\pi}{12}$$

$$= \frac{1}{2} \log 3 = \log \sqrt{3}$$

Sol.8 (D)

$$\int_{\pi/6}^{\pi/3} \frac{dx}{\sin 2x} = \int_{\pi/6}^{\pi/3} \operatorname{cosec} 2x \, dx$$

$$= \left[\frac{1}{2} \operatorname{logtan} \left(\frac{2x}{2} \right) \right]_{\pi/6}^{\pi/3}$$

$$= \frac{1}{2} \left[\log \tan \frac{\pi}{3} - \log \tan \frac{\pi}{6} \right]$$

$$= \frac{1}{2} \left[\log \sqrt{3} - \log \frac{1}{\sqrt{3}} \right]$$

Sol.9 (B)

$$\text{Since } f(x) = \int_0^x t \sin t \, dt$$

$$\therefore f'(x) = x \sin x$$

Sol.10 (A)

$\sin x$ is an odd function of x

$$\therefore \int_{-\pi/2}^{\pi/2} \sin x \, dx = 0$$