

JEE

AI24BTECH11004-BHERI SAI LIKITH REDDY

1 SECTION-A JEE ADVANCED/ IIT-JEE

$$1) \left| \begin{array}{ccc} f(x) & \cos(x) & \sec^2(x) + \cot(x) \\ \sec(x) & \cos(x) & \sec^2(x) + \cot(x) \\ \cos^2(x) & \cos^2(x) & \operatorname{cosec}^2(x) \\ 1 & \cos^2(x) & \cos^2(x) \end{array} \right| =$$

Then $\int_0^{\frac{\pi}{2}} f(x) dx = \text{_____}$ (1987 - 2 Marks)

2) The integral $\int_0^{1.5} (x^2) dx$, (1988 - 2 Marks) Where $[d]$ denotes the greatest integer function, equals _____

3) The value of $\int_{-2}^2 |1 - x^2| dx$ is _____ (1989 - 2 Marks)

4) The value of $\int_{\frac{\pi}{4}}^{\frac{3\pi}{4}} \frac{\phi}{1 + \sin \phi} d\phi$ (1993 - 2 Marks)

5) The value of $\int_2^3 \frac{\sqrt{x}}{\sqrt{5-x} + \sqrt{x}} dx$ (1994 - 2 Marks)

6) If for nonzero x , $af(x) + bf\left(\frac{1}{x}\right) = \frac{1}{x} - 5$ where $a \neq b$, then $\int_1^2 f(x) dx = \text{_____}$ (1996 - 1 Mark)

7) If $n > 0$, $\int_1^{2\pi} \frac{x \sin^{2n} x}{\sin^{2n} x + \cos^{2n} x} dx$ (1996 - 1 Mark)

8) The value of $\int_1^{e^{27}} \frac{\pi \sin(\pi \ln x)}{x} dx$ is _____ (1997 - 2 Marks)

9) Let $\frac{d}{dx} F(x) = \frac{e^{\sin(x)}}{x}$, $x > 0$. If $\int_1^4 \frac{2e^{\sin(x^2)}}{x} = F(k) - F(1)$ then one of the possible values of k is _____ (1997 - 2 Marks)

2 SECTION B TRUE/FALSE

1) The value of the integral $\int_0^{2a} \frac{f(x)}{(f(x) + f(2a-x))} dx$ is equal to a (1988 - 1 Mark)

3 SECTION C MCQs WITH ONE CORRECT ANSWER

1) The value of the definite integral $\int_0^{2a} (1 + e^{-x^2}) dx$ is

- a) -1
- b) 2
- c) $1 + e^{-1}$
- d) none of these

(1981 - 2 Marks)

2) Let a, b, c be non-zero real numbers such that $\int_0^1 (1 + \cos^8(x)) (ax^2 + bx + c) dx = \int_0^2 (1 + \cos^8(x)) (ax^2 + bx + c) dx$. Then the quadratic equation $ax^2 + bx + c = 0$ has

- a) no roots in $(0, 2)$
- b) at least one root in $(0, 2)$
- c) double root in $(0, 2)$
- d) two imaginary roots

(1981 - 2 Marks)

3) The area bounded by the curves $y = f(x)$, the x -axis and the ordinate $x = 1$ and $x = b$ is $(b-1) \sin(3b+4)$. Then $f(x)$ is

- a) $(x-1) \cos(3x+4)$
- b) $\sin(3x+4)$
- c) $\sin(3x+4) + 3(x-1) \cos(3x+4)$
- d) none of the above

(1982 - 2 Marks)

4) The value of the integral $\int_0^{\frac{\pi}{2}} \frac{\sqrt{\cot(x)}}{\sqrt{\cot(x)} + \sqrt{\tan(x)}} dx$ is

- a) $\frac{\pi}{4}$
- b) $\frac{\pi}{2}$
- c) π
- d) none of the above

(1983 - 1 Marks)

5) For any integer n the integral-

$\int_0^\pi e^{\cos^2(x)} \cos^3(2n+1)x dx$ has the value

- a) π
- b) 1
- c) 0
- d) none of these

(1985 - 2 Marks)