

JEE

AI24BTECH11004-BHERI SAI LIKITH REDDY

I. SECTION-A JEE ADVANCED/ IIT-JEE

- 1) $f(x) = \begin{vmatrix} \sec(x) & \cos(x) & \sec^2(x) + \cot(x) \operatorname{cosec}(x) \\ \cos^2(x) & \cos^2(x) & \operatorname{cosec}^2(x) \\ 1 & \cos^2(x) & \cos^2(x) \end{vmatrix}$ (1981 - 2 Marks)
- Then $\int_0^{\frac{\pi}{2}} f(x) dx = \underline{\hspace{2cm}}$ (1987 - 2 Marks)
- 2) The integral $\int_0^{1.5} (x^2) dx$, (1988 - 2 Marks)
Where $[d]$ denotes the greatest integer function, equals $\underline{\hspace{2cm}}$
- 3) The value of $\int_{-2}^2 |1 - x^2| dx$ is $\underline{\hspace{2cm}}$ (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 $\int_1^2 f(x) dx = \underline{\hspace{2cm}}$ (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 $\int_1^{e^{37}} \frac{\pi \sin(\pi \ln x)}{x} dx$ is $\underline{\hspace{2cm}}$ (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 $\underline{\hspace{2cm}}$ (1997 - 2 Marks)
- b) 2
c) $1 + e^{-1}$
d) none of these
- 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)

II. 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)

III. 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