EXAM NO: 10 XII

MAX MARKS : 64

MAX TIME : 2hr 15 Min

INTEGRATION & A.O.I

DO ANY 16 QUESTIONS (4 MARKS EACH)

Q.No: 1 $I = \int_0^{\pi} \frac{x\,dx}{a^2\cos^2 x + b^2\sin^2 x}$

Q.No: 2 → $I = \int \frac{\sqrt{x^2+1}\,\left[\log(x^2+1) - 2\log x\right]}{x^4}\,dx$

Q.No 3 → $I = \int_{\pi/6}^{\pi/3} \frac{\sin x + \cos x}{\sqrt{\sin(2x)}}\,dx$

Q.No 4 → $I = \int \log(\log x) + \frac{1}{(\log x)^2}\,dx$

Q.No 5 → $I = \int_0^{\pi} \frac{x\tan x}{\sec x + \tan x}\,dx$

Q.No. 6 → $I = \int \frac{\sin^{-1}\sqrt{x} - \cos^{-1}\sqrt{x}}{\sin^{-1}\sqrt{x} + \cos^{-1}\sqrt{x}}\,dx$

Q.No. 7 → $I = \int_{-1}^{3/2} |x\sin(\pi x)|\,dx$

Q.No. 8 → $I = \int_0^{\pi/2} \log(1+\cos x)\,dx$

Q.No 9 → $I = \int \frac{(x^2+1)(x^2+2)}{(x^2+3)(x^2+4)}\,dx$

Q.No. 10 → $I = \int \frac{5x+3}{\sqrt{(x+3)(2-x)}}\, dx$

Q.No. 11 → $I = \int_0^{\pi/2} \frac{\cos^2 x}{\cos^2 x + 4\sin^2 x}\, dx$

Q.No. 12 → Using Integration, find the area of the region bounded by the lines $2x+y=4$; $3x-2y=6$ and $x-3y=-5$

Q.No. 13 → Find the area of the region

$\{(x,y): 0 \le y \le x^2+1 ; 0 \le y \le x+1 ; 0 \le x \le 2\}$

Q.No. 14 → Find the area in the first quadrant and bounded by $y=4x^2$; $x=0$; $y=1$ & $y=4$

Q.No. 15 → Prove that the curves $y^2=4x$ and $x^2=4y$ divide the area of the square bounded by $x=0$, $x=4$, $y=4$, $y=0$ in to three equal parts.

Q.No. 16 → Evaluate $\int_0^{\pi/2} \sin(2x)\cdot \tan^{-1}(\sin x)\, dx$

Q.No. 17 → Evaluate $\int \frac{1}{x^{1/2}+x^{1/3}}\, dx$

Q.No. 18 → Evaluate $\int_1^5 |x-2| + |x-4| + |x-3|\, dx$

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