

6 – Marks

(1) Evaluate : $\int_0^{\pi/2} x \, dx / (\cos x + \sin x)$

(2) Evaluate : $\int_0^{\pi} \log(1 + \cos x) \, dx$

(3) Evaluate : $\int_0^{\pi} x \, dx / (a^2 \cos^2 x + b^2 \sin^2 x)$

(4) Find the area of region $\{ (x, y) : 0 \leq y \leq x^2 + 1, 0 \leq y \leq x + 1, 0 \leq x \leq 2 \}$

(5) Using the method of integration find the area of the region bounded by the lines: $2x + y = 4$,
 $3x - 2y = 6$ & $x - 3y + 5 = 0$.

(6) Find the area of the region enclosed between the two circles $x^2 + y^2 = 1$ and $(x - 1)^2 + y^2 = 1$.

(7) Find the area of the circle $x^2 + y^2 = 16$ exterior to the parabola $y^2 = 6x$.

(8) Find the area of the region enclosed by the parabola $x^2 = y$, the line $y = x + 2$ & the x-axis.

4 – Marks

(9) Evaluate : $\int_0^{\pi/4} \log(1 + \tan x) \, dx$

(10) Evaluate : $\int_0^{\pi/2} (2 \log \sin x - \log \sin 2x) \, dx$

(11) Evaluate : $\int_{\pi/6}^{\pi/3} dx / (1 + \sqrt{\tan x})$

(12) Evaluate : $\int_0^{\pi} x \, dx / (1 + \sin x)$

(13) Evaluate : $\int_0^{2\pi} dx / \{e^{\sin x} + 1\}$

(14) Evaluate : $\int (\sin^{-1} x)^2 \, dx$

(15) Evaluate the integrals by limits of a sum : $\int_1^4 (x^2 + x) \, dx$

(16) Evaluate : $\int (2 + \sin 2x) e^x \, dx / (1 + \cos 2x)$

(17) Evaluate : $\int \{ \sqrt{\tan x} + \sqrt{\cot x} \} \, dx$

(18) Evaluate : $\int [\log(\log x) + \{1 / \log x\}^2] \, dx$

(19) Evaluate : $\int \tan^{-1} \{ \sqrt{1-x} / \sqrt{1+x} \} \, dx$

(20) Evaluate : $\int (3 \sin x - 2) \cos x \, dx / \{5 - \cos^2 x - 4 \sin x\}$

(21) Evaluate : $\int (x^2 + 1) \, dx / \{x^2 - 5x + 6\}$
