Engineering Mathematics - II

Integration

Imp **2 marks Questions**

(1) (i) Integrate $\int \sqrt{1+\cos 2x}\, dx$

(ii) Evaluate $\int e^x \sin e^x\, dx$

(iii) Integrate $\int \frac{\sec^2 x}{1+\tan x}\, dx$

(iv) Evaluate $\int_2^4 [x]\, dx$

(v) Integrate $\int \frac{\operatorname{cosec}^2 x}{1+\cot x}\, dx$

(vi) Find $\int_0^{\pi/4} \frac{1}{1+x^2}\, dx$

(vii) Integrate $\int \frac{1}{2-5x}\, dx$

(viii) Evaluate $\int_{-1}^{1} x\, dx$

(ix) Evaluate $\int e^{(5x+3)}\, dx$

(x) Evaluate $\int_{-2}^{2} |x|\, dx$

(xi) Find $\int_0^1 \frac{1}{\sqrt{1-x^2}}\, dx$

Imp 5 marks Questions

(2) Integrate $\int \frac{e^x - e^{-x}}{e^x + e^{-x}} dx$

(3) Evaluate $\int_{-2}^{2} ([x] + |x|) dx$

(4) Evaluate $\int_0^{\pi/2} \frac{\sqrt{\tan x}}{\sqrt{\tan x} + \sqrt{\cot x}} dx$

(5) Find the area bounded by the curve $y^2 = x$, $x = 0$, $y = 1$

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

(7) Find the area bounded by the curve $xy = c^2$, the x-axis and $x = 2$, $x = 3$.

(8) Prove that $\int \frac{dx}{\sqrt{a^2 - x^2}} = \sin^{-1}\frac{x}{a} + c$ where c is integrating constant.

(9) Evaluate $\int_0^{\pi/2} \frac{dx}{1 + \cot x}$

(10) Evaluate $\int_0^{\pi/2} \frac{\cos x}{\cos x + \sin x} dx$

(11) Find the value of $\int_0^{\pi/2} \frac{\sqrt{\cos x}}{\sqrt{\cos x} + \sqrt{\sin x}} dx$

(12) Evaluate $\int_0^{\pi/2} \log \tan x \, dx$

(13) Evaluate $\int e^x \cdot \sin x \, dx$

(14) Integrate $\int e^{\cos^2 x} \sin 2x \, dx$

(15) Integrate $\int \frac{e^x + e^{-x}}{e^x - e^{-x}} dx$

(16) Integrate $\int \tan^{-1}(\sec x + \tan x) dx$

(17) Integrate $\int x \tan^{-1} x \, dx$

(18) Integrate $\int \log(1 + x^2) dx$

(19) Integrate $\int \sin^{20} x \cdot \cos^3 x \, dx$

(20) ~~Integrate~~ ~~Evaluate $\lim_{x \to \pi/2} (\pi/2 - x) \tan x$~~.

(20) Find $\int \frac{e^x}{x}(1 + x \ln x) dx$

10 marks Questions

(21) Integrate $\int e^{3x} \cos 2x \, dx$

(22) Evaluate $\int \frac{4x^2 - x + 3}{(x^2+1)(x-1)} \, dx$

(23) Evaluate $\int \frac{x}{(x-1)(x^2-4)} \, dx$

(24) Integrate $\int e^{2x} \sin 3x \, dx$

(25) Find area bounded by the curve $x^2 + y^2 = 9$.

(26) Find the total area of the circle $x^2 + y^2 = 16$.

(27) Evaluate $\int \frac{x}{(x-1)(x^2+9)} \, dx$

(28) Integrate $\int \frac{x^2}{(x^2+2)(x^2+3)} \, dx$

(29) Prove that $\int_0^{\pi/2} \log(\sin x) \, dx = -\pi/2 \log$

(30) Find the area of the circle of radius 'a' and whose centre is at origin