

Q1: Choose the Correct Answer (And Fill the Table Blew)

(10 Marks, 1 For Each )

$$(1) \text{The Value of } \int_1^4 \frac{1}{\sqrt{x}} dx = \dots$$



(2) Given The Initial value problem  $\frac{dy}{dx} = 2x + 1, y(0) = 3$  Then :

- (a)  $y = x^2$       (b)  $y = x^2 + x$       (c)  $y = x^2 + x + 3$       (d)  $y = x^2 + x - 2$

(3) The value of  $x^*$  that satisfies the mean value theorem of integration , for

$f(x) = 2x - 3$  on  $[1,5]$  is



$$(4) \quad \frac{d}{dx} \int_0^x \sin^2 t \, dt = \dots \dots \dots$$

- (a)  $\sin^2 x$       (b)  $\cos^2 t + c$       (c)  $\frac{1}{2}\sin(2t) + c$       (d) *None of them*

$$(5) \int \frac{dx}{x\sqrt{x^2 - 4}} = \dots \dots \dots \dots \dots$$

- (a)  $\frac{1}{2} \sin^{-1} \left( \frac{x}{2} \right) + c$       (b)  $\frac{1}{2} \tan^{-1} \left( \frac{x}{2} \right) + c$       (c)  $\frac{1}{2} \sec^{-1} \left| \frac{x}{2} \right| + c$       (d) *None of them*

(6) To Solve  $\int \sin^3 x \cdot \cos^2 x \, dx$ , We use :

- (a)  $u = \tan x$       (b)  $u = \sin x$       (c)  $u = \sin x \cos x$       (d)  $u = \cos x$

(7) The arc-length of the curve  $y = \sqrt{3} x$ , Between  $x = 0$  and  $x = 2$  is



$$(8) \text{If } \int_3^8 f(x)dx = 12, \text{Then } \int_8^3 2f(x)dx = \dots \dots \dots \dots \dots \dots$$



(9) To Evaluate  $\int \frac{x^3 - 3x}{x^2 + 4x - 7} dx$ , We First Use ..... .... .... .... ....

- (a) Long Division      (b) Partial Fractions    (c) Laws of Power      (d) None of them

(10) To Evaluate  $\int \sqrt{x^2 - 4} dx$  We Use :

- (a)  $x = 2 \tan \theta$       (b)  $x = 2 \sec \theta$       (c)  $x = 2 \sin \theta$       (d) None of them

Q2 : Evaluate Each Integral :

( 24Marks , 4 for Each )

$$(a) \int \frac{2}{\sec x} e^{\sin x} dx \quad (U - Substitution)$$

$$(b) \int \cos^{-1} x \, dx \quad (\text{By Parts})$$

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$$(c) \int \frac{dx}{x^2 - 6x + 10} \quad (\text{Completing the Square})$$

$$(d) \int \frac{t}{\sqrt{4+t^2}} dt$$

(Trigonometric Substitution)

$$(e) \int_0^3 \left( 2x + \sqrt{9 - x^2} \right) dx$$

(Geometrically)

$$(f) \int_{-\infty}^0 \frac{3}{1+x^2} dx$$

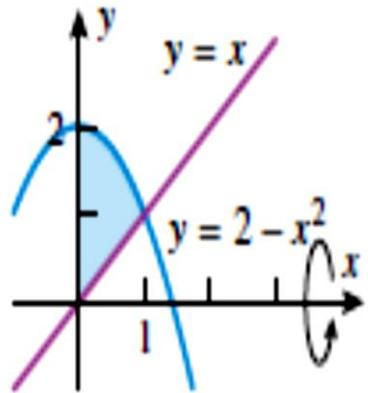
( *Improper* )

Q3- Answer the following :

(6+5+5Marks)

- (a) Find the Area Between  $y = 4 - x^2$ , and  $y = x + 2$

- (b) Find the volume of the solid that results when the shaded Region is revolved about the X- axis.



- (c) Find the arc length of the curve  $y = x^{3/2}$  from  $x = 1$  to  $x = 8$

End of Questions