

CALCULUS

* $\int \frac{(3^{x+1})-7^{x-1}}{21^x} dx = \frac{K_1}{3^x} + \frac{K_2}{7^x}$ then K_1 K_2 are

a) $\frac{1}{7 \log 3}, \frac{1}{3 \log 7}$

b) $\frac{1}{7 \log 3}, \frac{-1}{3 \log 7}$

c) $\frac{1}{7 \log 3}, \frac{-3}{\log 7}$

d) $\frac{3}{\log 7}, \frac{-7}{\log 3}$

Ans : c)

* $\int \frac{x+\sin x}{1+\cos x} = f(x) \times g(x) + c$ then, $f(x)$ & $g(x)$ respectively are

a) $\frac{x}{2}, \tan \frac{x}{2}$

b) $x, \tan \frac{x}{2}$

c) $x^2, \tan x^2$

d) $\frac{x^2}{2}, \tan (x/2)$

Ans: a)

* $\int_1^a [x] f^1(x) dx$ $a > 1$ where $[.]$ Denotes G.I.P is . . .

a) $[a] f(a) - \{ f(1)+f(2)+ \dots \dots \dots f[a] \}$.

b) $[a] f[a] - \{ f(1)+f(2)+ \dots \dots \dots f[a] \}$.

c) $a f[a] - \{ f(1)+f(2)+ \dots \dots \dots f[a] \}$.

d) $a f(a) - \{ f(1)+f(2)+ \dots \dots \dots f[a] \}$.

Ans : a)

* $\lim_{x \rightarrow 0} \frac{\int_0^{x^2} \sec^2 t \, dt}{x \sin x}$

- a) 1
- b) 2
- c) 3
- d) $\frac{1}{2}$

Ans : a)

* $\frac{\int_0^n [x] \, dx}{\int_0^n \{x\} \, dx}$ is

- a) 1
- b) $n - 1$
- c) $\frac{1}{n-1}$
- d) n

Ans : b)

* $\int_2^6 \frac{\sqrt{x} \, dx}{\sqrt{x} + \sqrt{8-x}} = \frac{4}{2}$

- a) 2
- b) $\frac{3}{2}$
- c) 4
- d) 1

Ans : a)

* $I_1 = \int_0^1 2^{x^2} \, dx$, $I_2 = \int_0^1 2^{x^3} \, dx$, $I_3 = \int_1^2 2^{x^2} \, dx$, $I_4 = \int_1^2 2^{x^3} \, dx$ then,

- a) $I_2 > I_1$
- b) $I_1 > I_2$
- c) $I_3 = I_4$
- d) $I_3 > I_4$

Ans : b)

- * $\int_{-1}^3 (|x - 2| + [x]) dx$ is
- a) 4
 - b) 5
 - c) 6
 - d) 7

Ans : d)

- * $\int_2^4 \frac{\log x^2 dx}{\log x^2 + \log(36 - 12x + x^2)}$
- a) 2
 - b) 4
 - c) 6
 - d) 1

Ans: d)

- * The point of inflection on the graph of $y = \int_0^x (t - 1)(t - 2)^2 dt$ is $x =$ _____
- a) $\frac{4}{3}$
 - b) $\frac{3}{4}$
 - c) $\frac{-4}{3}$
 - d) $\frac{-3}{4}$

Ans : a)

- * $\int_0^1 x(1-x)^{99} dx = \frac{1}{K} = \frac{1}{10100}$ then K is

- a) 10100
- b) 10010
- c) 11000
- d) 10001

Ans : a)

* $\int_0^{\pi^2/4} \sin\sqrt{x} \, dx$, $x = t^2$
 $dx = 2tdt$

- a) 0
- b) 1
- c) 2
- d) $\sqrt{2}$

Ans : c)

* $\int_0^{100\pi} \sqrt{1 - \cos 2x} \, dx$ is

- a) $100\sqrt{2}$
- b) $200\sqrt{2}$
- c) 0
- d) 100π

Ans : b)

* The difference between greatest & least value of $F(x) = \int_0^x (t + 1) \, dt$ on $[2, 3]$ is

- a) 3
- b) 2
- c) $\frac{7}{2}$
- d) 1

Ans : c)

* $\int_0^{\infty} \frac{dx}{(x^2+4)(x^2+9)} = \frac{\pi}{K}$ then 'K' is

- a) 60
- b) 120
- c) 80
- d) 100

Ans : a)