

Unit: 1 (34 Questions)

Unit:1 The differential equation of orthogonal trajectory of family of curves $xy=c$ is

The differential equation of orthogonal trajectory of the family of curves $xy = c$ is

- $xdx + ydy = 0$
- $ydx - xdy = 0$
- $ydx + xdy = 0$
- $xdx - ydy = 0$

Ans:D ($xdx-ydy=0$)

Unit 1 : If $I=E/R(1-e^{-Rt})$ & $E=500$ volts $R=250$ ohms $L=640H$. Then the maximum value of I is

If $I = \frac{E}{R}(1 - e^{-\frac{Rt}{L}})$ & $E=500$ volts $R=250\Omega$
 $L=640 H$, Then maximum value of I is

- 0.5
- 0
- 2
- None of these

Ans:c (=2)

Unit 1: The solution of the differential equation: $dy/dx = e^{x+y} + x^2 e^y$

The solution of the differential equation

$$\frac{dy}{dx} = e^{x+y} + x^2 e^y$$

$e^y + e^x + \frac{x^3}{3} + c = 0$

$e^{-y} + e^x + \frac{x^3}{3} + c = 0$

$e^{-y} + e^x - \frac{x^3}{3} + c = 0$

None of these

Ans:B

Unit:1 The voltage drop across capacitor of capacitance C is

The voltage drop across capacitor of capacitance C is

$\frac{1}{C} \int I dt$

$C \int I dt$

$C \frac{dI}{dt}$

$\frac{1}{C} \frac{dI}{dt}$

Ans: A [1/C integral(I dt)]

Unit:1 The differential equation of orthogonal trajectory of the family of curves $r=a(1-\cos\theta)$

The differential equation of orthogonal trajectory of the family of curves $r = a(1 - \cos\theta)$



$$r \frac{d\theta}{dr} + \tan\left(\frac{\theta}{2}\right) = 0$$



none of these



$$r \frac{d\theta}{dr} + \cot\left(\frac{\theta}{2}\right) = 0$$



$$\frac{1}{r} \frac{d\theta}{dr} + \cot\left(\frac{\theta}{2}\right) = 0$$

Ans: option C : $r(d\theta/dr) + \cot(\theta/2)$

Unit 1: Which of these is not a homogeneous function

Which of the following is not a homogeneous function

$\frac{x}{e^y}$

$\sqrt{x+y}$

$\sin x$

$\sin(\frac{x}{y})$

Ans: Sin X

Unit 1: Linear form of the differential equation $yx = x^3y^3$ using proper substitution

Linear form of the differential equation $\frac{dx}{dy} - yx = x^3y^3$ using proper substitution is

$\frac{du}{dy} - (2y)u = 2y^3$

$\frac{du}{dy} + (2y)u = -2y^3$

$\frac{du}{dx} - (2y)u = 2x^3$

$\frac{du}{dx} + (2y)u = 2x^3$

Ans:B $\frac{du}{dy} + (2y)u = -2y^3$

UNIT 1: Variable separable form of the differential equation

Variable separable form of the differential

$$\text{equation } \left(\frac{e^{-2\sqrt{x}}}{\sqrt{x}} - \frac{y}{\sqrt{x}} \right) \frac{dx}{dy} = 1$$

$$\frac{dy}{dx} + \frac{1}{\sqrt{x}}y = \frac{e^{-2\sqrt{x}}}{\sqrt{x}}$$

None of these

$$\frac{dy}{dx} + \frac{1}{\sqrt{x}}y = \frac{e^{2\sqrt{x}}}{\sqrt{x}}$$

$$\frac{dy}{dx} - \frac{1}{\sqrt{x}}y = \frac{e^{-2\sqrt{x}}}{\sqrt{x}}$$

sAns: A (none of these if wanna go for variable separable form of the eq)

UNIT 1: The solution of the LDE $dy/dx + (1+2x)y = e^{x^2}$

Solution of the L.D.E. $\frac{dy}{dx} + (1 + 2x)y = e^{-x^2}$ is

$$\boxed{\frac{dy}{dx} + (1 + 2x)y = e^{-x^2}}$$

$$ye^{x+x^2} = e^{-x} + c$$

$$ye^{x+x^2} = e^x + c$$

$$ye^{x-x^2} = e^x + c$$

none of these

Ans: B

Unit:1 $2\frac{dy}{dx} - y\sec x = y^3 \tan x$ Linear form of these equation is

$2\frac{dy}{dx} - y\sec x = y^3 \tan x$ linear form of these equation is

$\frac{du}{dx} - (\sec x)u = \tan x$

$\frac{du}{dx} + (\sec x)u = -\tan x$

$\frac{du}{dx} + (\sec x)u = \tan x$

$\frac{du}{dx} - (\sec x)u = -\tan x$

Ans: B

Unit:1 The integrating factor for the differential equation of rl series circuit is

The integrating factor for the differential equation of R-L series circuit is

$e^{-\frac{Lt}{R}}$

$e^{\frac{Rt}{L}}$

$e^{-\frac{Rt}{L}}$

$e^{\frac{Lt}{R}}$

Ans:B $e^{RT/L}$

Unit:1: If $I = e/r + ke^{-rt}/l$ then maximum value of I is

If $I = \frac{E}{R} + k e^{-\frac{Rt}{L}}$ then maximum value of I is

| |
|--|
| <input type="checkbox"/> K |
| <input type="checkbox"/> $\frac{E}{R}$ |
| <input type="checkbox"/> $\frac{E}{R} + k$ |
| <input type="checkbox"/> 0 |

Ans:B(E/R)

Unit:1 Tangent at $p=(a,0)$ to the curve $ay^2=x^2(a-x)$ is

Tag to Revisit

Tangent at $p= (a, 0)$ to the curve $ay^2 = x^2(a - x)$ is

Reset Next >

| |
|--|
| <input type="checkbox"/> Parallel to y-axis |
| <input type="checkbox"/> Tangent makes acute angle with x-axis |
| <input type="checkbox"/> No tangent at p |
| <input type="checkbox"/> Parallel to x-axis |

Ans:A (parallel to y axis)

Unit:1 The solution of the differential equation $xe^{x^2}dx = ye^{-y^2}dy$

The solution of the differential equation $xe^{x^2}dx = ye^{-y^2}dy$

$e^{x^2} + e^{-y^2} = c$

None of these

$e^{x^2} - e^{-y^2} = c$

$e^{x^2} + e^y = c$

Ans:A

Unit:1 The integrating factor of $xcosx \frac{dy}{dx} + y(xsinx + cosx) = 1$

The integrating factor of $xcosx \frac{dy}{dx} + y(xsinx + cosx) = 1$

$\frac{cosx}{x}$

None of these

$xcosx$

$\frac{x}{cosx}$

Ans:d

Unit:1 The integrating factor of equation $(x^2+y^2+x)dx+xydy=0$

The integrating factor of the equation $(x^2 + y^2 + x)dx + xydy = 0$ is $\frac{1}{x}$ x^2 $\frac{1}{x^2}$ x

Ans: x (check just in case)

Unit 1: The differential equation whose general solution is $y=csinx$ (differential equations)

The differential equation whose general solution is $y = csinx$ is $\frac{d^2y}{dx^2} + y = 0$ $\frac{d^2y}{dx^2} - y = 0$ $\frac{dy}{dx} + y = 0$ None of these

Ans: a

UNIT 1 The value of the integral $e^{-t} t^4 dt$ is

Tag to Revisit

The value of the integral $\int_0^\infty e^{-t} t^4 dt$ is

24

60

120

30

Ans: 24

Unit 1 : Which of the following is not a homogeneous function

Which of the following is not a homogeneous function

$\sin\left(\frac{x}{y}\right)$

$\frac{x}{e^y}$

$\sin x$

$\sqrt{x+y}$

Ans : $\sin x$

Unit 1 :The differential equation whose general solution is $y=A\cos(nx+B)$ is

The differential equation whose general solution is $y = A\cos(\eta x + B)$ is

$\frac{dy}{dx} + \eta^2 y = 0$

$\frac{d^2y}{dx^2} + \eta y = 0$

$\frac{d^2y}{dx^2} - \eta^2 y = 0$

$\frac{d^2y}{dx^2} + \eta^2 y = 0$

Ans:C

Unit 1 The integrating factor of the differential equation($x^4e^x - 2mxy^2$)dx

The integrating factor of the differential equation $(x^4e^x - 2mxy^2)dx + 2mx^2ydy = 0$

$4x$

$\frac{4}{x}$

$\frac{-4}{x}$

Exact so factor is 1

Ans:

Unit 1 Let I be the current flowing in the circuit containing inductance

Let I be the current flowing in the circuit containing inductance L & capacitance C in a series without applied e.m.f. E then the differential equation is

$L \frac{dI}{dt} + \frac{q}{C} = E$

$L \frac{dI}{dt} + \frac{q}{C} = 0$

None of these

$L \frac{dI}{dt} - \frac{q}{C} = 0$

Ans: B

Unit 1 The charge flowing through the R-C series cct with no applied E.M.F

Zug zu Recht.

The charge flowing through the R-C series cct with no applied E.M.F is

$Q = e^{-tRC} K \quad K=\text{constant}$



$Q = e^{\frac{-t}{RC}} K \quad K=\text{constant}$

$Q = e^{\frac{t}{RC}} K \quad K=\text{constant}$

None of these

Ans: B

Unit 1 : Solution of the differential equation $\frac{dy}{dx} = 1 + y^2 / (1 + x^2)$

Solution of the differential equation $\frac{dy}{dx} = \frac{1+y^2}{1+x^2}$

- none of these
- $\frac{x+y}{1-xy} = c$
- $\frac{1+x}{1-xy} = c$
- $\frac{1+y}{1-xy} = c$

Ans: none of these (ans- $\left[\frac{y-x}{1+yx} \right]$

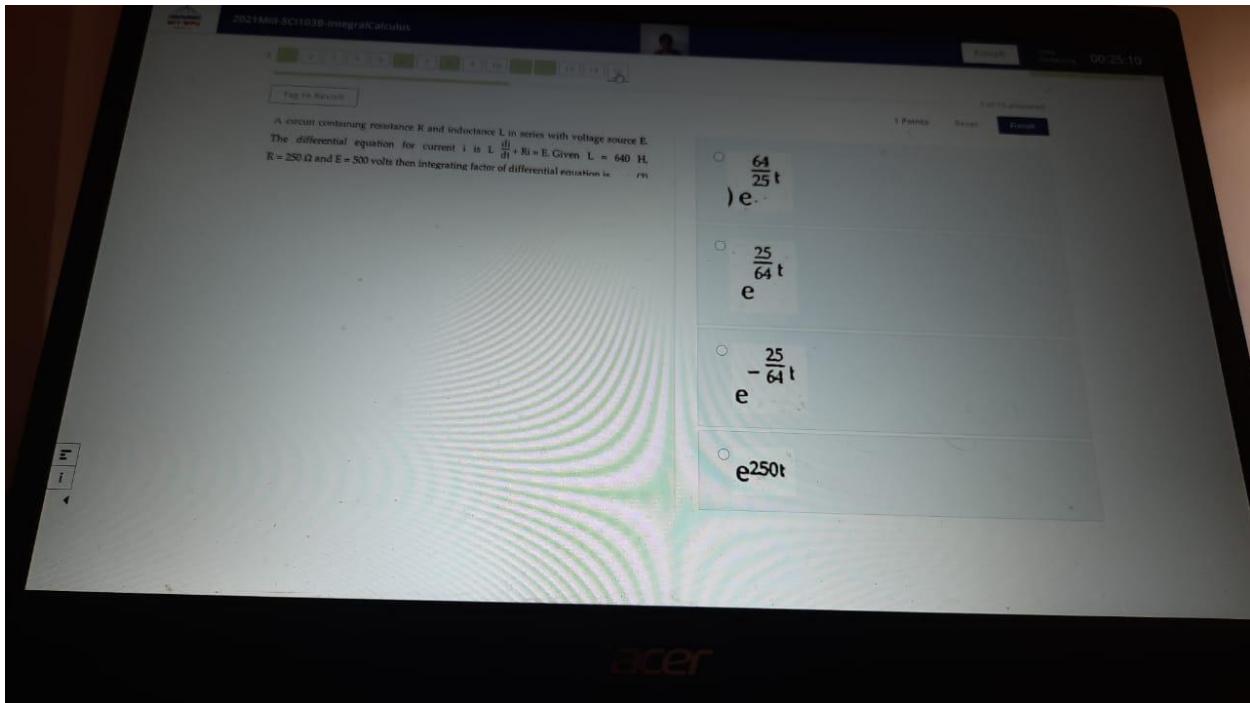
Unit 1 : The G.S of D.E

The G.S of D.E $x^3 \frac{dy}{dx} = \sec y$ is

- $\sin y + \frac{1}{x^2} = c$
- $\cos y + \frac{1}{2x^2} = c$
- $\cos y - \frac{1}{2x^2} = c$
- $\sin y + \frac{1}{2x^2} = c$

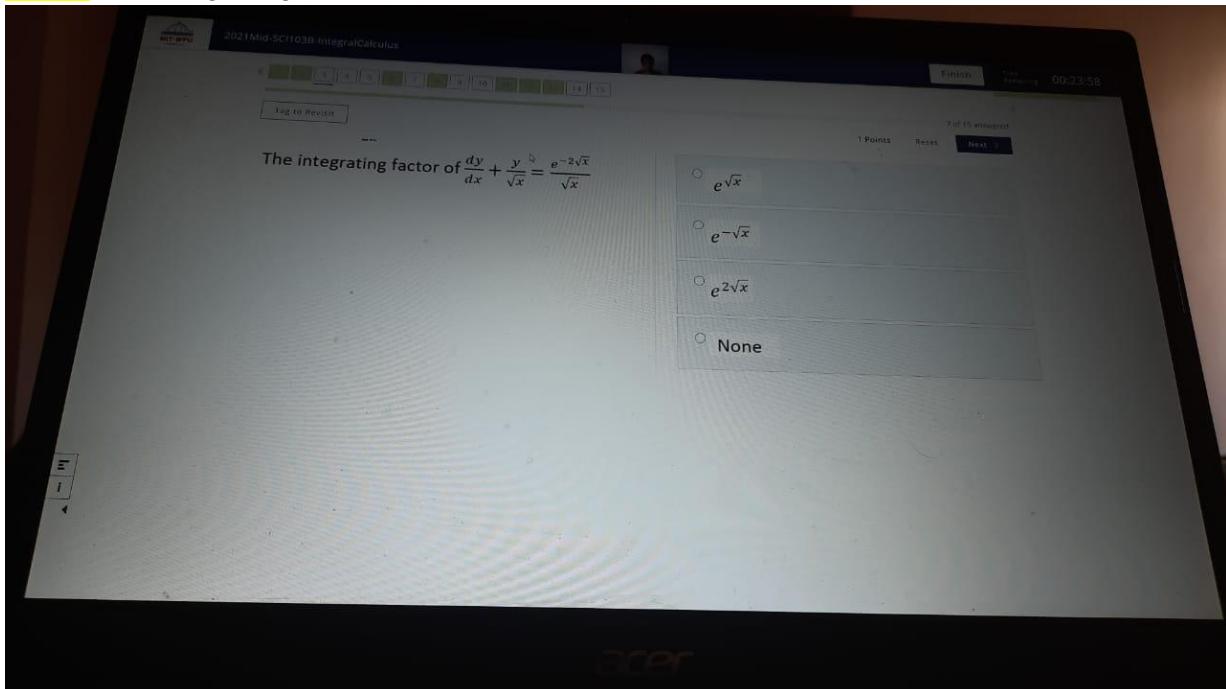
Ans. D

Unit 1 : A circuit containing R and inductance R and Inductance L in series with Voltage source E.



Ans. B

Unit 1: The integrating Factor of



Ans. C

Unit 1 : In a circuit containing resistance R and inductance L in series with constant voltage Source E

In a circuit containing resistance R and inductance L in series with constant voltage source E , current i is given by $i = \frac{E}{R} (1 - e^{-\frac{R}{L}t})$, then maximum current flows is (1)

1 Points Reset Next 0 of 15 unanswered

$\frac{E}{R}$

$\frac{R}{E}$

ER

0

Ans. option A : E/R

Unit 1: If the differential equation of family of curves $r = a \cos^2 \theta$

If the differential equation of family of curves $r = a \cos^2 \theta$ is $\frac{dr}{d\theta} = -2r \tan \theta$ then its orthogonal trajectories is given by (2)

2 of 15 unanswered

1 Points Reset Next 0 of 15 unanswered

$\frac{1}{2} \log \sin \theta = \log r + \log k$

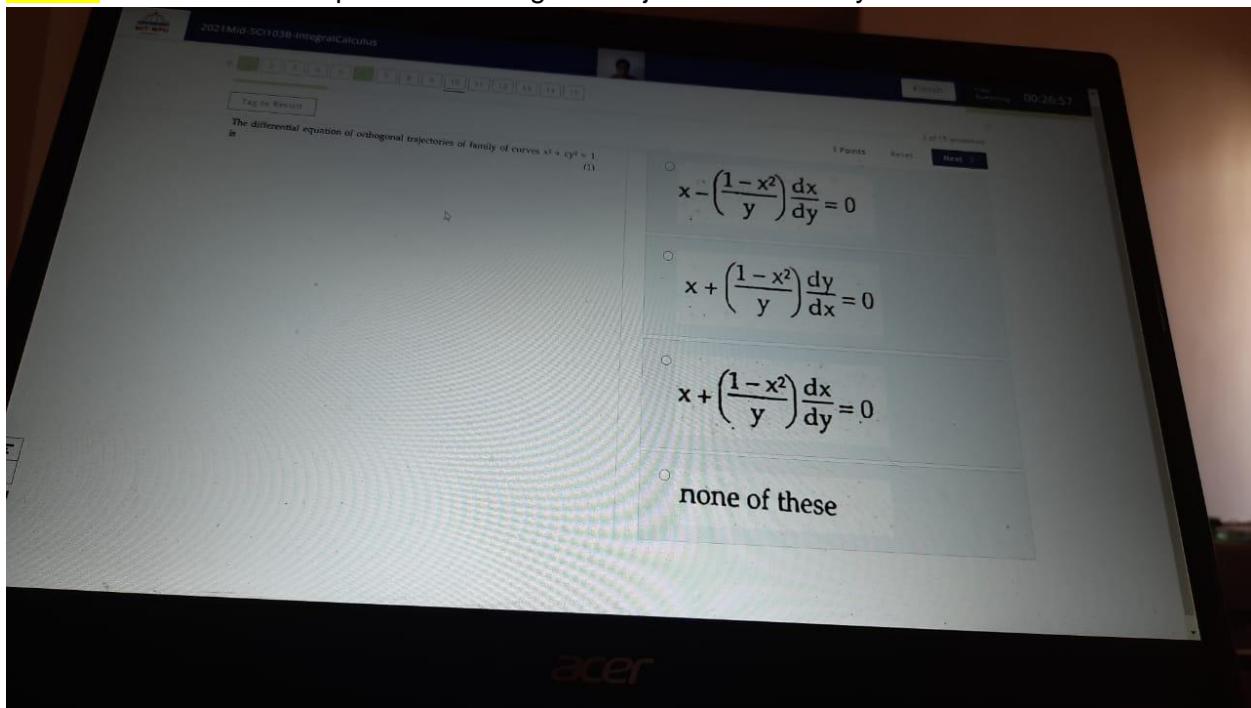
$\frac{1}{2} \log \sin \theta = -\log r + \log k$

$\log \sin \theta = r + k$

$\log \sec \theta = -\log r + \log k$

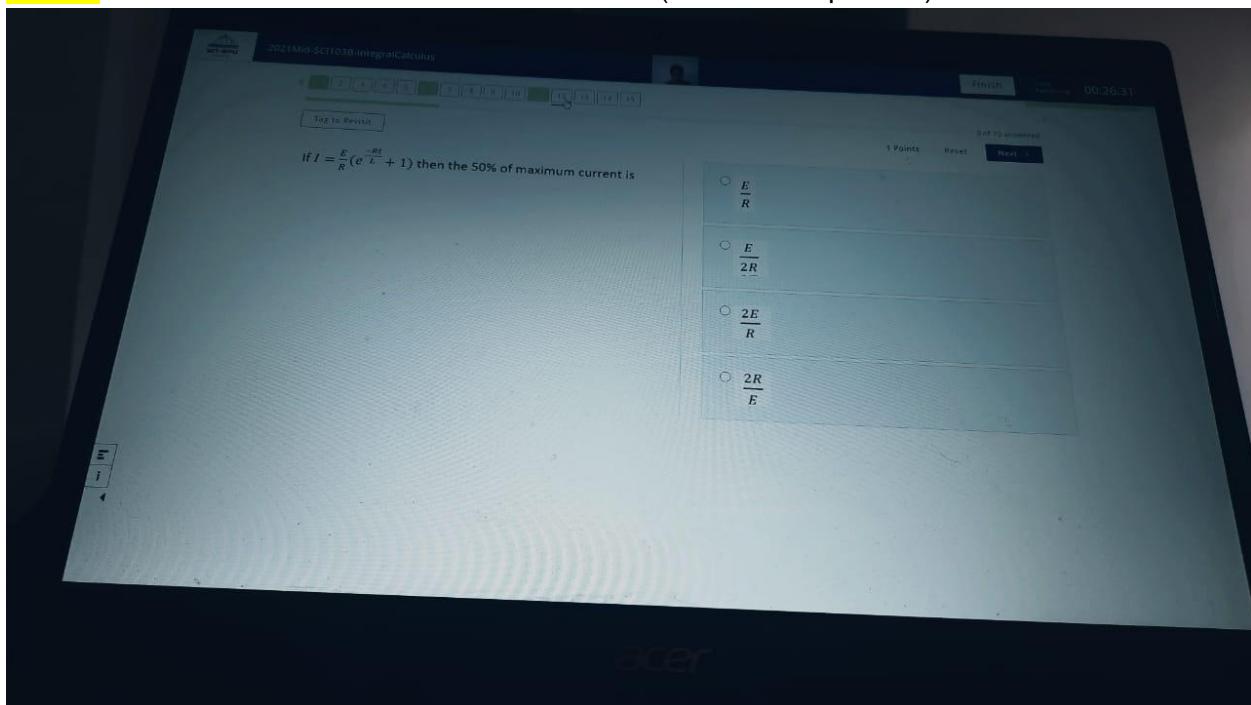
Ans. option B : $\frac{1}{2} \log \sin \theta = -\log r + \log k$

Unit 1 : The differential equation of orthogonal trajectories of family of curves



Ans. A

Unit 1 : If $I =$ then the 50% of maximum current is (should be option a)



Ans. A

Unit 1: The charge Q on the plate of the condenser of capacity C charged through resistance R by a steady voltage R by a steady voltage V satisfy the differential equation

The charge Q on the plate of the condenser of capacity C charged through a resistance R by a steady voltage V satisfy the differential equation $R \frac{dQ}{dt} + \frac{Q}{C} = V$. If Q=0 at t=0 then $Q = CV(1 - e^{-\frac{t}{RC}})$. Then maximum current is

$\frac{V}{R}$

0

CV

None of these

Ans. V/R

Unit 1:A steam pipe 20cm in diameter in protected with covering 6cm

1 Points Reset

A steam pipe 20 cm in diameter is protected with covering 6 cm thick for which thermal conductivity $k = 0.0003$ in steady state. The inner surface of the pipe is at 200°C and outer surface of the covering is at 30°C and differential equation of conduction of heat is $dT = -\frac{Q}{2\pi k} \frac{dx}{x}$. The amount of heat loss Q is

(2)

$\frac{170 (2\pi k)}{\log (1.6)}$

$-\frac{170 (2\pi k)}{\log (1.6)}$

$\frac{\log (1.6)}{170 (2\pi k)}$

$\frac{170}{\log (1.6)}$

Ans: A

Unit: 2

28 questions

Unit:2 If $F(x) = \dots$, then the values of a_n and b_n are

If $f(x) = \frac{\pi^2}{2} - \frac{x^2}{4}$, $-\pi \leq x \leq \pi$ then values of a_n and b_n are

$0, \frac{2}{\pi n}$

$\frac{(-1)^{n+1}}{n^2-1}, 0$

$0, \frac{(-1)^{n+1}}{n^2}$

$\frac{-(-1)^n}{n^2}, 0$



Ans: D

Unit 2: If $f(x) = e^x, -1 \leq x \leq 1$ then constant term of $f(x)$ in fourier expansion is

If $f(x) = e^x, -1 \leq x \leq 1$ then constant term of $f(x)$ in fourier expansion is

$\frac{e-e^{-1}}{2}$

$\frac{e+e^{-1}}{2}$

$\frac{1+e}{2}$

$\frac{e}{2}$



Ans A

Unit:2 Fourier series representation of periodic function $f(x)=\pi^2-x^2$ Then the value of: $1/(1^2)-1/(2^2)+1/(3^2)+\dots=?$

Fourier series representation of periodic function $f(x)=\pi^2-x^2$, $-\pi \leq x \leq \pi$, is
 $\pi^2-x^2 = \frac{2\pi^2}{3} + 4 \sum_{n=1}^{\infty} \frac{(-1)^{n+1}}{n^2} \cos nx$, then the value of $\frac{1}{1^2}-\frac{1}{2^2}+\frac{1}{3^2}-\frac{1}{4^2}+\dots=?$

$\frac{\pi^2}{12}$

$\frac{\pi^2}{6}$

$\frac{\pi^2}{3}$

$\frac{\pi^2}{4}$

Ans: C

Unit 2: If $f(x)=\cosh ax$, then which of the following statements is correct.

If $f(x) = \cosh ax$, $-\pi < x < \pi$ and $f(x) = \frac{a_0}{2} + \sum_{n=1}^{\infty} (a_n \cos nx + b_n \sin nx)$ then which of the following statement is correct.

$a_0 = \frac{2 \cosh a\pi}{a\pi}, b_n = 0$

$a_0 = \frac{2 \sinh a\pi}{a\pi}, b_n = 0$

$a_0 = \frac{2 \sinh a\pi}{a\pi}, b_n = \frac{2 \cosh a\pi}{a\pi}$

None of these

Answer → option B

Unit 2: If $f(x) = \pi^2/2 - x^2/4$, then values of a_n and b_n are

If $f(x) = \frac{\pi^2}{2} - \frac{x^2}{4}$, $-\pi \leq x \leq \pi$ then values of a_n and b_n are

$0, \frac{3}{n\pi}$

$\frac{(-1)^n + 1}{n^2 - 1}, 0$

$0, \frac{(-1)^{n+1}}{n^2}$

$\frac{-(-1)^n}{n^2}, 0$

Ans: option D

UNIT 2 : The curve $y+f(x)$ exists in $[a,b]$. Has a point of inflection if

The curve $y=f(x)$ exists in $[a, b]$. Has a point of inflection if

$f''(x) < 0$ for all x in $[a, b]$

$f''(x) = 0$ for all x in $[a, b]$

$f''(x) > 0$ for all x in $[a, b]$

$f''(x) = 0$ for some x in $[a, b]$

Ans:D $f''x = 0$ for some x in $[a,b]$

Unit:2 If $f(x)$ the constant term of $f(x)=$ in fourier expansion

If $f(x) = e^x$, $-1 \leq x \leq 1$ then constant term of $f(x)$ in fourier expansion is

$\frac{e-e^{-1}}{2}$

$\frac{e+e^{-1}}{2}$

$\frac{1+e}{2}$

$\frac{e}{2}$

Ans:A

Unit:2 IF $a_n = 2/n^2 - 1$ for $n > 1$, then the Fourier series of $f(x) = x \sin x$ in $0 \leq x \leq 2\pi$, the value of a_1 is

If $a_n = \frac{2}{n^2-1}$ for $n > 1$, in the Fourier series of $f(x) = x \sin x$ in $0 \leq x \leq 2\pi$, the value of a_1 is

1/2

1/3

-1/3

-1/2

Ans: -1/2

Unit:2 Fourier coefficient a_0 in the Fourier series expansion of $f(x+2\pi) = f(x)$

Fourier coefficient a_0 in the Fourier series expansion of $f(x) = \left(\frac{\pi-x}{2}\right)^2$; $0 \leq x \leq 2\pi$ and $f(x+2\pi) = f(x)$ is

0

$\frac{\pi}{6}$

$\frac{\pi^2}{6}$

$\frac{\pi^2}{3}$

Ans: $(\pi^2)/12$ answer aa rha he

Unit:2 period is 2, the fourier series is represented by, then the fourier coefficient a_0 is

$f(x) = 4 - x^2$, $0 \leq x \leq 2$ and period is 2. the fourier series is represented by
 $\frac{a_0}{2} + \sum_{n=1}^{\infty} \left(a_n \cos \frac{2\pi nx}{3} + b_n \sin \frac{2\pi nx}{3} \right)$, then fourier coefficient a_0 is

12/3

11/3

16/3

13/3

Ans: c(16/3)

Unit:2 The Constant terms in the fourier series of

The constant terms in the Fourier series of

| | | | | | | |
|---|---|----|----|----|----|----|
| x | 0 | 1 | 2 | 3 | 4 | 5 |
| y | 9 | 18 | 24 | 28 | 26 | 20 |

20

41.66

-8.33

20.83

Ans:D(20.83)

Unit:2 From certain Data sigma y=4.5 and m=6, the value of constant term in the fourier series is

From certain data $\sum y = 4.5$ and $m = 6$, the value of constant term in the fourier series is

0.75

4.5

none of these

1.5

Ans:A(0.75)

Unit:2 Fourier series in the interval $(0, 2\pi)$ of (x_i, y_i) then constant a_0 is

If $y=f(x)=\frac{a_0}{2} + \sum_{n=1}^{m-1} (a_n \cos nx + b_n \sin nx)$ is Fourier series in the interval $(0, 2\pi)$ of (x_i, y_i) , $i=1, 2, 3, \dots, m$ then the constant a_0 is

mean value of $y=f(x)$ in $(0, 2\pi)$

None of these

$\frac{1}{4} x$ mean value of $y=f(x)$ in $(0, 2\pi)$

$2 x$ mean value of $y=f(x)$ in $(0, 2\pi)$

Ans: D

Unit:2 The value of a_1 in harmonic analysis of y for the following tabulated data is

| The value of a_1 in Harmonic analysis of y for the following tabulated data is: | | | | | | | |
|---|---|---------------|----------------|----|----------------|---------------|---|
| x | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| y | 9 | 18 | 24 | 28 | 26 | 20 | 9 |
| $\cos \frac{\pi x}{3}$ | 1 | $\frac{1}{2}$ | $-\frac{1}{2}$ | -1 | $-\frac{1}{2}$ | $\frac{1}{2}$ | 1 |

-6.33

None of these

-5.33

8.33

Ans: B (-1)

Unit:2 Fourier is represented by , then fourier coefficient a_0 is

$$f(x) = \begin{cases} x, & 0 \leq x \leq \pi \\ 0, & \pi < x \leq 2\pi \end{cases} \quad \text{and } f(x + 2\pi) = f(x); \text{fourier series is represented by} \\ \frac{a_0}{2} + \sum_{n=1}^{\infty} (a_n \cos nx + b_n \sin nx), \text{then fourier coefficient } a_0 \text{ is}$$

$\frac{\pi}{2}$

$\frac{\pi}{3}$

2π

0

Ans: Pi/2

UNIT 2 The following values of y give the displacement in inches of a certain machine part for the rotation

The following values of y give the displacement in inches of a certain machine part for the rotation x of the flywheel

| | | | | | | |
|---|---|---------|----------|----------|----------|----------|
| x | 0 | $\pi/6$ | $2\pi/6$ | $3\pi/6$ | $4\pi/6$ | $5\pi/6$ |
| Y | 0 | 9.2 | 14.4 | 17.8 | 17.3 | 11.7 |

What is the value of a_0

23.466

13.664

33.466

5.564

Ans: a

Unit 2 : The value of fourier constant a1 for $f(x)=x \sin x$ in the interval

The value of Fourier constant a_1 for $f(x) = x \sin x$ in the interval $0 \leq x \leq 2\pi$ is _____

$\frac{1}{2}$

1

-1

$-\frac{1}{2}$

Ans: A = $\frac{1}{2}$

Unit 2 IN fourier series

In Fourier series for $f(x) = x$ in the interval $-\pi \leq x \leq \pi$ which of the following is correct

$a_0 = \frac{\pi}{2}, a_n = \frac{1+(-1)^n}{n}, b_n = \frac{-2(-1)^n}{n}$

$a_0 = \pi, a_n = \frac{1+(-1)^n}{n}, b_n = 0$

$a_0 = 0, a_n = 0, b_n = 0$

$a_0 = 0, a_n = 0, b_n = \frac{-2(-1)^n}{n}$

Ans:D

Unit2 The value of a_n in the fourier series of

The value of a_n in the fourier series of $f(x) = 4 - x^2$ in $0 < x < 2$, is

$\frac{1}{n^2\pi^2}$

$-\frac{4}{n^2\pi^2}$

$-\frac{2}{n^2\pi^2}$

$\frac{4}{n^2\pi^2}$

Ans: $-4/n^2\pi^2$

Unit: 2 The value of a_n in the fourier series

The value of a_n in the fourier series of $f(x) = \begin{cases} \cos x; & -\pi < x < 0 \\ -\cos x; & 0 < x < \pi \end{cases}$

$\frac{(-1)^n}{n}$

0

$\frac{1}{n}$

 1

Ans: 0

Unit 2

And period is 2. The fourier series is represented by

U_VII MULTIPLE INTEGRAL U1_ODE & Application U3_Curve Tracing **U2_Fourier series** U_V REDUCTION GAMMA U_VI Beta DUE

1 2 3

Tag to Revisit

$f(x) = \begin{cases} 1, & -1 < x < 0 \\ \cos \pi x, & 0 < x < 1 \end{cases}$ and period is 2. The Fourier series is represented by $\frac{a_0}{2} + \sum_{n=1}^{\infty} (a_n \cos nx + b_n \sin nx)$, then Fourier coefficient a_0 is

2
 0
 1
 -1

E **i**

Answer: 0

Unit 2 Fourier coefficient of f which of the following correct.

Tag to Revisit

If $a_0 = \frac{4\pi^2}{3}$, $a_n = \frac{4(-1)^{n+1}}{n^2}$ are the fourier coefficient of $f(x)$ in $-\pi \leq x \leq \pi$ then which of the following correct

$f(x) = \frac{4\pi^2}{3} + \sum_{n=1}^{\infty} \frac{4(-1)^{n+1}}{n^2} \sin nx$

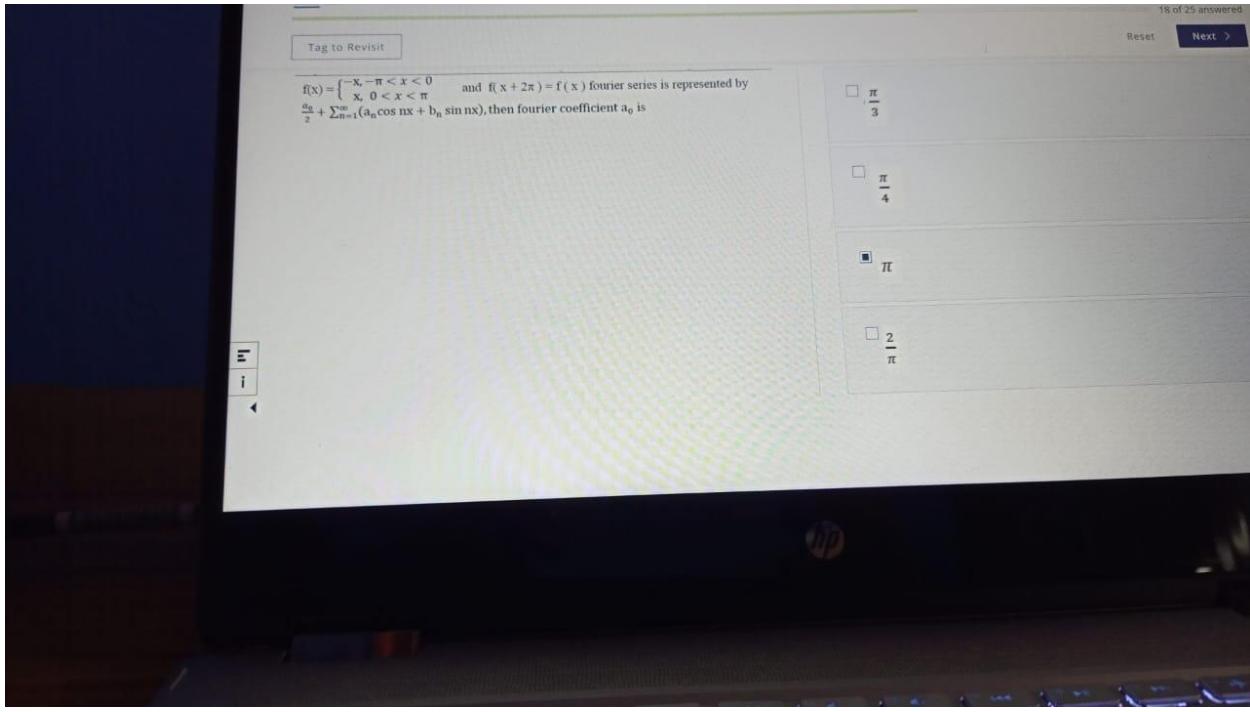
$f(x) = \frac{2\pi^2}{3} - \sum_{n=1}^{\infty} \frac{4(-1)^n}{n^2} \cos nx$

$f(x) = \frac{2\pi^2}{3} + \sum_{n=1}^{\infty} \frac{4(-1)^{n+1}}{n^2} \cos \frac{nx}{2}$

None of these

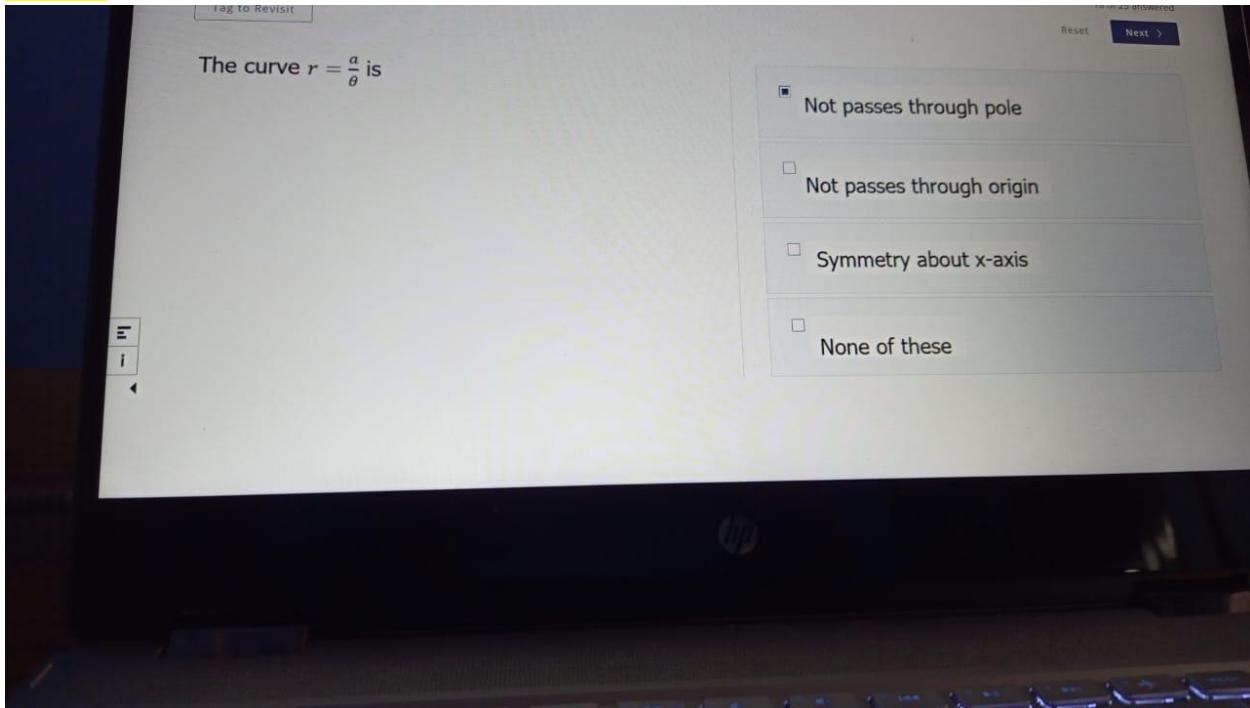
Ans:D

Unit 2 : Fourier series is represented by



Ans.

Unit 2 : The curve $r = a/\theta$ is



Ans. option A

Unit 2 : The Fourier constant 'b_a' for f(x) = x,

The Fourier constant 'b_a' for f(x) = x, in the interval $-\pi \leq x \leq \pi$ is

$(-1)^{n+1} \frac{2}{n}$

$\frac{2}{n}$

$-\frac{2}{n}$

$(-1)^{n+1} \frac{2}{n^2}$

Ans. Option A

Unit 2: IF a₀ are the fourier coefficient of f(x) in then which of the following correct

If $a_0 = \frac{4\pi^2}{3}$, $a_n = \frac{4(-1)^{n+1}}{n^2}$ are the fourier coefficient of f(x) in $-\pi \leq x \leq \pi$ then
which of the following correct

$f(x) = \frac{4\pi^2}{3} + \sum_{n=1}^{\infty} \frac{4(-1)^{n+1}}{n^2} \sin nx$

$f(x) = \frac{2\pi^2}{3} - \sum_{n=1}^{\infty} \frac{4(-1)^n}{n^2} \cos nx$

$f(x) = \frac{2\pi^2}{3} + \sum_{n=1}^{\infty} \frac{4(-1)^{n+1}}{n^2} \cos \frac{n\pi x}{2}$

None of these

Ans: D

Unit 2: The second harmonic fourier series of

Top or next sit | Reset

The second harmonic Fourier series of
is _____

| | | | | | | |
|---|---|----|----|----|----|----|
| x | 0 | 1 | 2 | 3 | 4 | 5 |
| y | 9 | 18 | 24 | 28 | 26 | 20 |

$a_2 \cos \frac{2\pi x}{3} + b_2 \sin \frac{2\pi x}{3}$

$a_2 \cos \pi x + b_2 \sin \pi x$

None of the above

$a_2 \cos 2\pi x + b_2 \sin 2\pi x$

Ans: D

Unit 2: If $f(x) =$

If $f(x) = \begin{cases} -x, & -\pi < x < 0 \\ x, & 0 < x < \pi \end{cases}$, then $f(x)$ is

Even function

none of these

Neither even nor odd

odd function

Ans: Even function

Unit: 3 (22 Questions)

Unit:3 The Angle between the radius vector and the tangent to the curve $r=a/2(1+\cos\theta)$

The angle between the radius vector & the tangent to the curve

$$r = \frac{a}{2}(1 + \cos\theta)$$

$\frac{\pi - \theta}{2}$

$\pi - \frac{\theta}{2}$

$\pi + \frac{\theta}{2}$

$\frac{\pi + \theta}{2}$

Ans: D

Unit 3: The curve $r = a\cos 5\theta$ can be obtained from $r = a\sin 5\theta$ by rotating plane through

The curve $r = a\cos 5\theta$ can be obtained from $r = a\sin 5\theta$ by rotating plane through

10π

5π

$\frac{\pi}{10}$

$\frac{\pi}{5}$

Ans: option C : $\pi/10$

UNIT 3 The curve $y=f(x)$ exists in $[a, b]$. Has a point of inflection if

The curve $y=f(x)$ exists in $[a, b]$. Has a point of inflection if

$f''(x) < 0$ for all x in $[a, b]$

$f''(x) = 0$ for all x in $[a, b]$

$f''(x) > 0$ for all x in $[a, b]$

$f''(x) = 0$ for some x in $[a, b]$

Ans: D

Unit:3 The curve $y(x^2+1)=x$ is symmetric about

The curve $y(x^2 + 1) = x$ is symmetric about

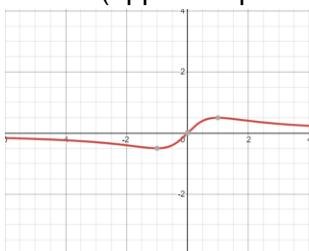
opposite quadrant

y-axis

$y=x$

x-axis

Ans: A (opposite quadrant)



Unit:3 For the curve $r=a \cos n\theta$ curve lies i.e. the region of existence of curve is

For the curve $r = a \cos n\theta$ curve lies i.e. the region of existence of curve is

- None of these
- Depends on θ
- Outside the circle of radius a
- Inside the circle of radius a

Ans: Inside the circle of radius a (D)

Unit:3 The Curve $r=a \cos 5\theta$ can be obtained from $r=a \sin 5\theta$ by rotating plane through

The curve $r = a \cos 5\theta$ can be obtained from $r = a \sin 5\theta$ by rotating plane through

- 10π
- 5π
- $\frac{\pi}{10}$
- $\frac{\pi}{5}$

Ans: C

$\pi/10$

UNIT 3 The points of intersection with y and x axis of the curve $y^2x = a(x^2 - a^2)$

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The points of intersection with Y & X-axis of the curve $y^2x = a(x^2 - a^2)$

- No point on X-axis & $(0, \pm a)$
- No point of intersection on both axes
- No point on Y-axis & $(\pm a, 0)$
- None of these

Ans: None of these

Unit 3 :Tangent at origin to the curve $r = a\cos 3\theta$

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Tangent at origin to the curve $r = a\cos 3\theta$

- None of these

- $\frac{\pi}{2}, \frac{3\pi}{2}, \frac{5\pi}{2}, \frac{7\pi}{2} \dots$

- $0, \frac{\pi}{3}, \frac{2\pi}{3}, \pi \dots$

- $\frac{\pi}{6}, \frac{\pi}{2}, \frac{5\pi}{6}, \frac{7\pi}{6} \dots$

Ans: d

Unit 3 : A double point at which distinct branches have distinct tangent is called as

A double point at which distinct branches have distinct tangent is called as

- None of these
- Node
- Multiple point
- Cusp

Ans: Node

Unit 3 : Asymptote parallel to x axis to the curve $x^2(x^2 - 4a^2) = y^2(x^2 - a^2)$

Asymptote parallel to X-axis to the curve $x^2(x^2 - 4a^2) = y^2(x^2 - a^2)$

- None of these
- a
- $\pm a$
- No Asymptote

Ans (+- a)

Unit 3 Orthogonal trajectory of the curve $y = ax^2$

Orthogonal trajectory of the curve $y = ax^2$ is

None of these

$\frac{x^2}{2} - y^2 = c$

$x^2 + y^2 = c$

$\frac{x^2}{2} + y^2 = c$

Ans: $X^2+Y^2=3$

Unit 3 The tangent at origin

The tangent at origin to the curve $y^2(2a - x) = x^3$

y-axis

no tangent at origin

$x=y$

x-axis

Ans: y-axis

Unit 3 Let P is any point on the curve and if

Let P is any point on the curve & if
 $(\frac{dy}{dx})_P > 0$ then

- Tangent makes obtuse angle with x
- Tangent parallel to x-axis
- Tangent makes acute angle with x-axis
- Tangent parallel to y-axis

Ans: tangent parallel to y axis

Unit 3 The curve is said to be concave upward at a if

The curve is said to be concave upward at A if

- Portion of the curve on the one side of A lies above the tangent to the curve at A
- Portion of the curve on the both sides of A lies below the tangent to the curve at A
- Portion of the curve on the both sides of A lies above the tangent to the curve at A
- Portion of the curve on the one side of A lies below the tangent to the curve at A

Ans: c

Unit 3 Region of existence

Region of existence of the curve $y^2 = \frac{a^2(a-x)}{x}$

$x > 0, x > a$

$0 < x < a$

None of these

$x < 0, x < a$

Ans: C kyuki y square 0 bhi ho skta he at x=a

Unit 3: The curve represented by the equation

The curve represented by the equation $x = a(t + \sin t), y = a(1 + \cos t)$ is

symmetrical about $y - \text{axis}$ and passing through origin

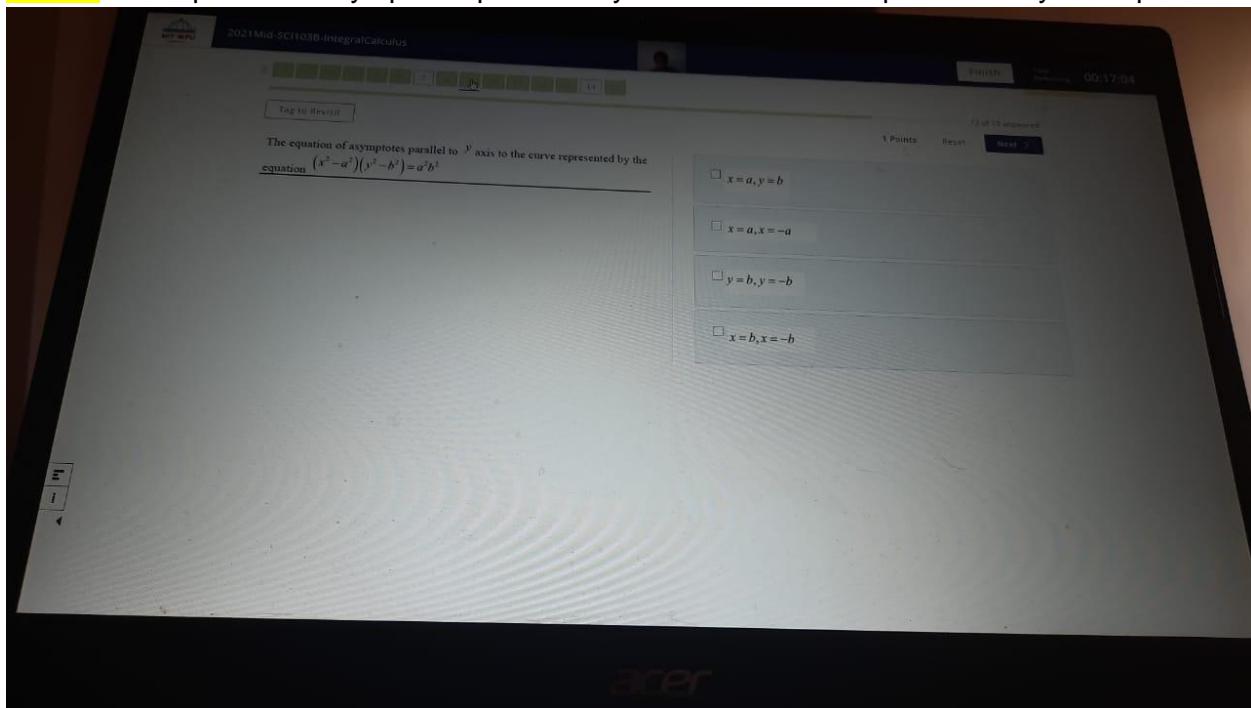
symmetrical about $x - \text{axis}$ and passing through origin

symmetrical about $x - \text{axis}$ and not passing through origin

symmetrical about $y - \text{axis}$ and not passing through origin

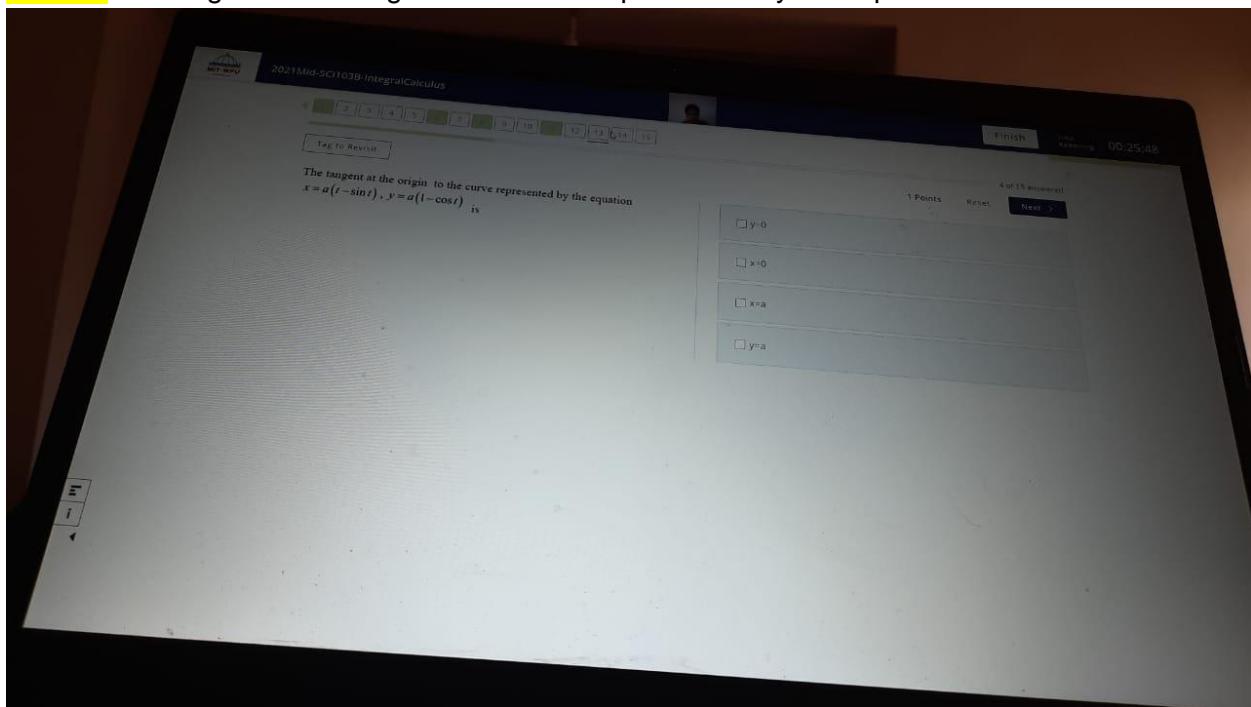
Ans. D

Unit 3 : The equation of asymptotes parallel to y axis to the curve represented by the equation



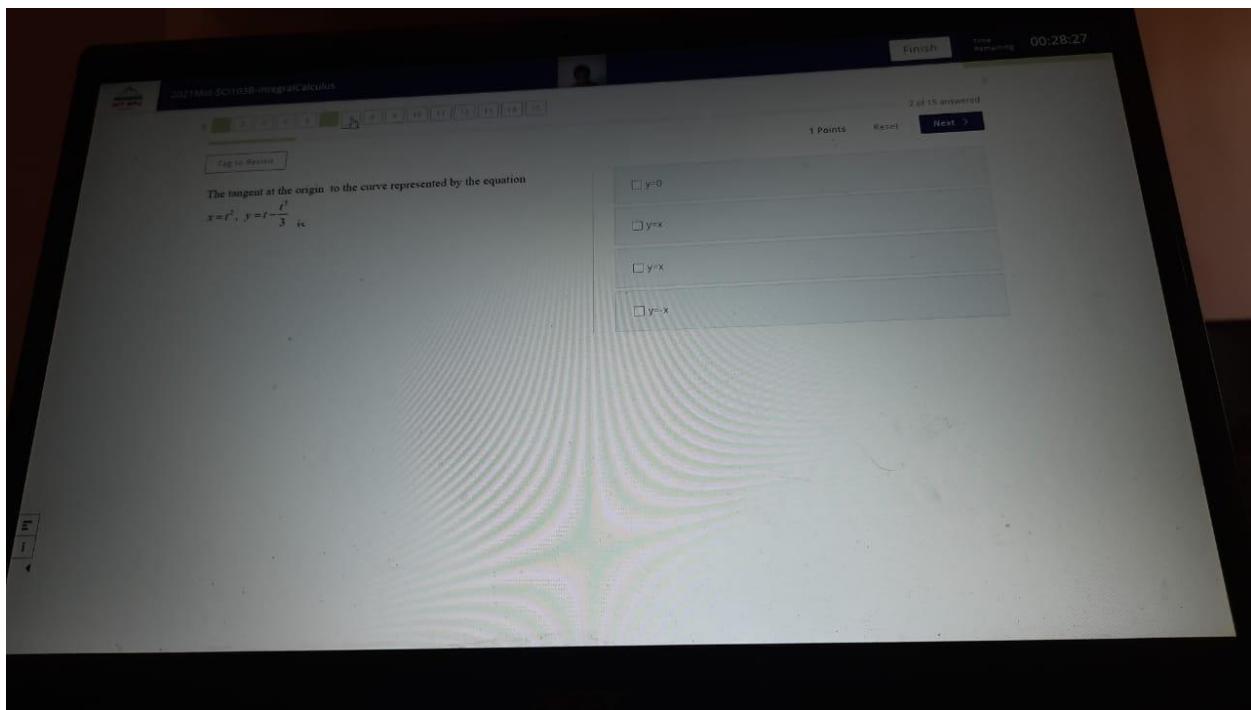
Ans. b

Unit 3 : The tangent at the origin to the curve represented by the equation



Ans. (option B)

Unit 3 : The tangent at the origin to the curve represented by the equation



Ans. correct ans not in options : $x=0$

Unit 3: For curve $r = \cos(\theta)$ curve lies i.e. the region of existence of curve is

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For the curve $r = a \cos n\theta$ curve lies i.e. the region of existence of curve is

Inside the circle of radius a

Depends on θ

Outside the circle of radius a

hp

Ans. B

Unit 3: Asymptote parallel to X-axis to the curve

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Asymptote parallel to X-axis to the curve $x^2(x^2 - 4a^2) = y^2(x^2 - a^2)$

- $\pm a$
- None of these
- a
- No Asymptote

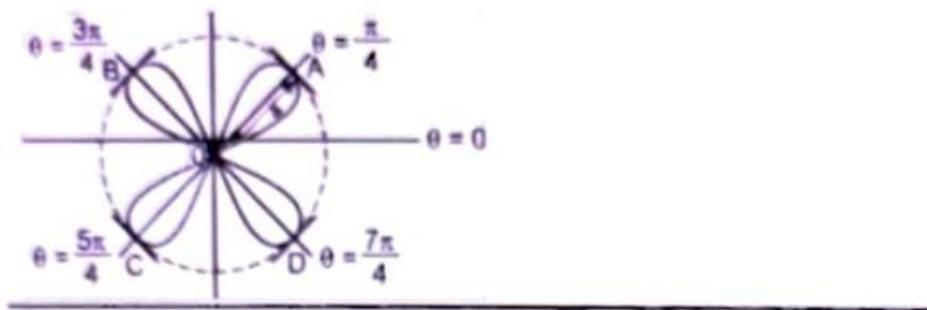
E
I



Ans
D

Unit 3: The following figure represents the curve whose equation is

The following figure represents the curve whose equation is



$$r = a \sin 2\theta$$



$$r = a \sin 3\theta$$

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Ans: A

Unit: 4

Unit: 5(13 questions)

Unit:5 The value of the integral by using substitution $\log(1/x) = t$

The value of the integral $\int_0^1 \frac{dx}{\sqrt{x \log(\frac{1}{x})}}$ by using substitution $\log \frac{1}{x} = t$ is

$\sqrt{\pi}$

$\sqrt{2\pi}$

$2\sqrt{\pi}$

$\frac{\sqrt{\pi}}{2}$

Ans: $\sqrt{2\pi}$ (option b)

Unit 5: The value of gamma fxn ($1/4$)*gamma fxn($3/4$) is

The value of $\left[\frac{1}{4} \right] \left[\frac{3}{4} \right]$ is

$\pi\sqrt{2}$

$\sqrt{\pi}$

π

2π

Ans: option a : $\pi\sqrt{2}$

Unit:5 The value of area=

$$\text{The value of area} = \int_0^{4a} dy \int_{\frac{y^2}{4a}}^{\sqrt{4ay}} dx$$

$\frac{16a^2}{3}$

24

a^2

$\frac{8a^2}{3}$

Ans:A

Unit:5 The angle between the radius vector and the tangent to the curve $r = a/2(1+\cos\theta)$

The angle between the radius vector & the tangent to the curve

$$r = \frac{a}{2}(1 + \cos\theta)$$

$\frac{\pi - \theta}{2}$

$\pi - \frac{\theta}{2}$

$\pi + \frac{\theta}{2}$

$\frac{\pi + \theta}{2}$

Ans: option A : $\pi/2 - \theta/2$

UNIT 5 The value of the integral $x^{p-1}/1+x.dx$ is

The value of the integral $\int_0^{\infty} \frac{x^{p-1}}{1+x} dx$ is,

$([p+1])^2$

$([p])^2$

$[p][1+p]$

$[p][1-p]$

Ans:D $[p][1-p]$

Unit:5 The value of the integral $e^{-x^2} dx$ by using substitution $x^2=t$ is

The value of the integral $\int_0^\infty e^{-x^2} dx$ by using substitution $x^2 = t$ is

$\frac{\sqrt{\pi}}{3}$

$2\sqrt{\pi}$

$\sqrt{\pi}$

$\frac{\sqrt{\pi}}{2}$

Ans:D

Unit 5 :The value of gamma 1/3 gamma(2/3) is

The value of $\int_{\frac{1}{3}}^{\frac{1}{2}} \left(\frac{2}{3}\right) dx$ is

$\frac{\pi}{\sqrt{3}}$

$\frac{2}{\sqrt{3}}$

2π

$\frac{2\pi}{\sqrt{3}}$

Ans: d $2\pi/\sqrt{3}$

Unit 5 The value of the integral

The value of the integral $\int_0^\infty x^9 e^{-2x^2} dx$ by using substitution $2x^2 = t$ is

$\frac{5}{32}$

$\frac{5}{64}$

$\frac{6}{32}$

$\frac{6}{2}$

Ans: 5/64

Unit 5 The value of dx is

The value of $\int_0^\infty \frac{x^a}{a^x} dx$ is

$\frac{a}{(\log a)^{a+1}}$

$\frac{[a+1]}{(\log a)^{a+1}}$

None of the above

$\frac{a}{(\log a)^a}$

Ans: B

Unit 5 The value of the integral by using substitution

The value of the integral $\int_0^1 x^{m-1} (1-x^2)^{n-1} dx$ by using substitution $x=\sqrt{t}$ is

$B\left(\frac{m}{2}, n\right)$

$B\left(\frac{m-1}{2}, n-1\right)$

$\frac{1}{2} B\left(\frac{m}{2}, n\right)$

$\frac{1}{2} B\left(\frac{m-1}{2}, n-1\right)$

Ans: C

Unit:5 The value of integral by using substitution method

The value of the integral $\int_0^1 (1-x^{1/n})^m dx$ by using substitution $x^{1/n}=t$ is

$B(n, m+1)$

$\int_0^1 (1-x^{1/n})^m$

$mB(m, n+1)$

$\checkmark nB(n, m+1)$

$B(m, n+1)$

Ans:C

Unit 5 The value of the integral by using substitution

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The value of the integral $\int_0^\infty \sqrt[4]{x} e^{-\sqrt{x}} dx$ by using substitution $\sqrt{x} = t$ is

$\frac{3\sqrt{\pi}}{2}$

$\frac{\sqrt{\pi}}{3}$

$\frac{15\sqrt{\pi}}{4}$

$\frac{3\sqrt{\pi}}{4}$

Ans: A

Unit 5: The value of $dx/3^4x^2$

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The value of $\int_0^\infty \frac{dx}{3^4x^2}$ is

None of the above

$\frac{\sqrt{\pi}}{4\sqrt{\log 3}}$

$\frac{\sqrt{\pi}}{\sqrt{\log 3}}$

$\frac{\sqrt{\pi}}{3\sqrt{\log 4}}$

Ans: B

Unit: 6 (34 Questions)

Unit:6 If $\text{erf}(ax) = 2/\sqrt{\pi}$... then $d/dx \text{erf}(ax) = ?$

If $\text{erf}(ax) = \frac{2}{\sqrt{\pi}} \int_0^x e^{-u^2} du$ then $\frac{d}{dx} \text{erf}(ax) = ?$

13 of 25 answered

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$ae^{-a^2x^2}$

$\frac{2x}{\sqrt{\pi}} e^{-a^2x^2}$

$\frac{2a}{\sqrt{\pi}} e^{-a^2x^2}$

$\frac{2x}{\sqrt{\pi}} e^{a^2x^2}$

Example 54. Prove that

$$\frac{d}{dx} [\text{erf}_c(ax)] = \frac{-2a}{\sqrt{\pi}} e^{-a^2x^2}$$

Ans:

Unit:6 $\text{erf}(x) + \text{erf}(-x) = ?$

1 2 3 4 5

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$\text{erf}(x) + \text{erf}(-x) = ?$

-1

0

1

2

Ans: option B (= 0) (Erf is odd function)

Unit 6: The value of the integral ... by using substitution root(x)= t

The value of the integral $\int_0^1 x^3(1 - \sqrt{x})^5 dx$ by using substitution $\sqrt{x} = t$ is

2B(7,6)

2B(6,4)

B(8,6)

2B(8,6)

Ans: 2B(8,6)

Unit:6 The value of the integral ... by using substitution $x^3=8t$

The value of the integral $\int_0^2 x(8 - x^3)^{1/3} dx$ by using substitution $x^3=8t$ is

$\frac{8}{3} B\left(\frac{2}{3}, \frac{4}{3}\right)$

$\frac{4}{3} B\left(-\frac{1}{3}, \frac{1}{3}\right)$

$\frac{2}{3} B\left(\frac{2}{3}, \frac{4}{3}\right)$

$\frac{2}{3} B\left(-\frac{1}{3}, \frac{1}{3}\right)$

Ans: option A (8/3)(B(2/3,4/3))

Unit 6: The value of the $B(m, n+1) + B(m+1, n)$

The value of the $B(m, n + 1) + B(m + 1, n)$ is

$B(m, n)$

$2 B(m, n + 1)$

$B(m-1, n-1)$

$2 B(m + 1, n)$

Ans: A ($B(m, n)$)

Unit:6 The Value of $\text{erf}(0)$ is

The value of $\text{erf}(0)$ is

-1

1

0

∞

Ans: C (0)

Unit 6: Using the DUIS rule the value of

Using DUIS Rule the value of the integral $\emptyset(\alpha) = \int_0^{\infty} \frac{e^{-\alpha x} \sin \alpha x}{x} dx$, with $\frac{d\emptyset}{d\alpha} = -\frac{1}{\alpha^2 + 1}$
and assuming $\int_0^{\infty} \frac{\sin x}{x} dx = \frac{\pi}{2}$ is

$-\tan^{-1} \alpha$

$\log(\alpha^2 + 1) + \frac{\pi}{2}$

$-\tan^{-1} \alpha + \frac{\pi}{2}$

$\tan^{-1} \alpha + \frac{\pi}{2}$

Ans: option a

Unit 6: $B(\frac{1}{4}, \frac{3}{4})$ is equal to

$B\left(\frac{1}{4}, \frac{3}{4}\right)$ is equal to

0

2π

$\frac{2\pi}{\sqrt{3}}$

$\pi\sqrt{2}$

Ans: option D root 2 pi

Unit 6: IF $(1-e^{-ax})dx$, $a>-1$ then by DUIS rule, $d\theta/d\alpha$

If $\emptyset(a) = \int_0^\infty \frac{e^{-x}}{x} (1 - e^{-ax}) dx, a > -1$ then by DUIS rule, $\frac{d\emptyset}{da}$ is

$$\int_0^\infty (e^{-ax}) dx$$

$$\frac{e^{-x}}{x} (1 - e^{-ax})$$

$$\int_0^\infty (e^{-(a+1)x}) dx$$

$$\int_0^\infty \frac{a}{x} (e^{-(a+1)x}) dx$$

Ans: D

Unit 6: $B(n, n+1)$ is equal to :

$B(n, n + 1)$ is equal to

$$\frac{(\lceil n \rceil)^2}{[2n]}$$

$$\frac{1}{2} \frac{(\lceil n \rceil)^2}{[2n]}$$

$$\frac{1}{2} \frac{(\lceil n+1 \rceil)^2}{[2n]}$$

$$\frac{1}{2} \frac{[n][n-1]}{[2n]}$$

Ans: B

Unit 6: The value of integral $\sin^n x \cos^{-n} x dx$ is

The value of the integral $\int_0^{\pi/2} \sin^n x \cos^{-n} x dx$ is

$\frac{1}{2} B(n+1, n-1)$

$\frac{1}{2} B\left(\frac{n+1}{2}, \frac{1-n}{2}\right)$

None of the above

$\frac{1}{2} B\left(\frac{n+1}{2}, \frac{n-1}{2}\right)$

Ans: option B : $\frac{1}{2} B\left(\frac{n+1}{2}, \frac{1-n}{2}\right)$

UNIT 6 : If $I(a) = \pi \log(a+b) + c$ then

If $I(a) = \int_0^{\pi/2} \log(a^2 \cos^2 \theta + b^2 \sin^2 \theta) d\theta$, and $I(a) = \pi \log(a+b) + c$ then c is

$\frac{\pi}{2}$

$-\pi \log 2$

π

0

Ans: B (-pi log2)

UNIT 6 If $I(A) = \log(a+1) + c$ is

If $I(a) = \int_0^\infty \frac{e^{-x}}{x} (1 - e^{-ax}) dx$, $a > -1$ and $I(a) = \log(a+1) + c$ then c is

$1-a$

1

0

$1+a$



Ans: 0

Unit:6 The value of $\text{erf}(\infty)$ is

The value of $\text{erf}(\infty)$ is

$2/\sqrt{\pi}$

0

1

∞

Ans : C

Unit:6 The value of integral by using substitution $x^{1/n}=t$ is

The value of the integral $\int_0^1 (1 - x^{1/n})^m dx$ by using substitution $x^{1/n}=t$ is

$mB(m, n + 1)$

$nB(n, m + 1)$

$B(n, m + 1)$

$B(m, n + 1)$

Ans: B

Unit:6 Erf(-x)

Erf(-x) is equals to

$-\text{erfc}(x)$

$\text{erf}(x)$

$\text{erfc}(x)$

$-\text{erf}(x)$

Ans: D

Unit:6 The value of the integral by using substitution $x=\sqrt{t}$

The value of the integral $\int_0^1 x^{m-1} (1-x^2)^{n-1} dx$ by using substitution $x=\sqrt{t}$ is

$B\left(\frac{m}{2}, n\right)$

$\frac{1}{2}B\left(\frac{m-1}{2}, n-1\right)$

$\frac{1}{2}B\left(\frac{m}{2}, n\right)$

$B\left(\frac{m-1}{2}, n-1\right)$

Ans:C(1/2B(m/2,n))

Unit:6 $B(m,n) * B(m+n,p)$ is equal to (beta function)

$B(m, n) \times B(m + n, p)$ is equal to

$\frac{[m][n]}{[m+n+p]}$

$\frac{[m][p]}{[m+n+p]}$

$\frac{[m][n][p]}{[m-n-p]}$

$\frac{[m][n][p]}{[m+n+p]}$

Ans: D

Unit:6 The curve $y(x^2+1)=x$ is symmetric about

The curve $y(x^2 + 1) = x$ is symmetric about

- x-axis
- opposite quadrant
- y-axis
- y=x

Ans: B opposite quadrant

Unit:6 The value of $\text{erfc}(0)$ is

The value of $\text{erfc}(0)$ is

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- 0
- 1
- 1
- $\sqrt{2}$

Ans: Should be 1 (B)

Unit 6: The value of $(1-x^3)^{-1/2} dx$

The value of $\int_0^1 (1 - x^3)^{-1/2} dx$ is

$B\left(\frac{1}{3}, \frac{1}{2}\right)$

$\left(\frac{2}{3}, \frac{1}{2}\right)$

$B(3, 2)$

$\frac{1}{3} B\left(\frac{1}{3}, \frac{1}{2}\right)$

Ans: d

Unit 6 :The value of the integral $\log 1/y^{n-1} dy$ by using substitution $\log(1/y)=t$

The value of the integral $\int_0^1 \left[\log\left(\frac{1}{y}\right) \right]^{n-1} dy$ by using substitution $\log\left(\frac{1}{y}\right) = t$ is

[n]

[n + 1]

[n - 1]

- [n]

Ans: [n-1]

Unit 6: The value of the $x^8/\sqrt{1-x^2}$

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The value of the $\int_0^1 \frac{x^8}{\sqrt{1-x^2}} dx$ is,

$\frac{1}{3}$

$\frac{2}{15}$

$\frac{7\pi}{512}$

$\frac{35\pi}{32}$

Ans: c :

Unit 6 : Error function of X, $\text{erf}(x)$ is defined as

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Error function of x , $\text{erf}(x)$ is defined as

$\frac{2}{\sqrt{\pi}} \int_0^u e^{-x^2} dx$

$\frac{2}{\sqrt{\pi}} \int_0^x e^{-u^2} du$

$\frac{2}{\sqrt{\pi}} \int_0^x e^{x^2} dx$

$\frac{2}{\sqrt{\pi}} \int_0^{\infty} e^{-x^2} dx$

Ans: b

Unit 6: The value of the integral $\sin^n x \cos^{-n} x dx$

The value of the integral $\int_0^{\pi/2} \sin^n x \cos^{-n} x dx$ is

$\frac{1}{2} B(n+1, n-1)$

$\frac{1}{2} B\left(\frac{n+1}{2}, \frac{1-n}{2}\right)$

None of the above

$\frac{1}{2} B\left(\frac{n+1}{2}, \frac{n-1}{2}\right)$

Ans: b

Unit 6: Using DUIS rule of the value of integral

Using DUIS Rule the value of the integral $\emptyset(a) = \int_0^{\infty} \frac{1-\cos ax}{x^2} dx$, with $\frac{d\emptyset}{da} = \frac{\pi}{2}$ is

$\frac{\pi a}{2}$

$\frac{\pi}{2}$

$\frac{\pi a}{2} + \frac{\pi}{2}$

πa

Ans: $\frac{\pi a}{2}$

Unit 6 erf(ax)dx

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$$\int_0^t \operatorname{erf}(ax) dx + \int_0^t \operatorname{erf}(ax) dx =$$

0

x

t

$\frac{t^2}{2}$

Ans- option c : t

UNIT 6: Using DUIS rule the value of the integral $e^{-ax} \sin ax / x dx$ from infinity to zero

Using DUIS Rule the value of the integral $\emptyset(\alpha) = \int_0^\infty \frac{e^{-ax} \sin ax}{x} dx$, with $\frac{d\emptyset}{d\alpha} = -\frac{1}{\alpha^2+1}$ and assuming $\int_0^\infty \frac{\sin x}{x} dx = \frac{\pi}{2}$ is

$\log(\alpha^2 + 1) + \frac{\pi}{2}$

$-\tan^{-1}\alpha + \frac{\pi}{2}$

$-\tan^{-1}\alpha$

$\tan^{-1}\alpha + \frac{\pi}{2}$

Ans: D

Unit:6 The value of $\int_0^\infty \frac{dx}{3^{4x^2}}$ is

The value of $\int_0^\infty \frac{dx}{3^{4x^2}}$ is

$\frac{\sqrt{\pi}}{3\sqrt{\log 4}}$

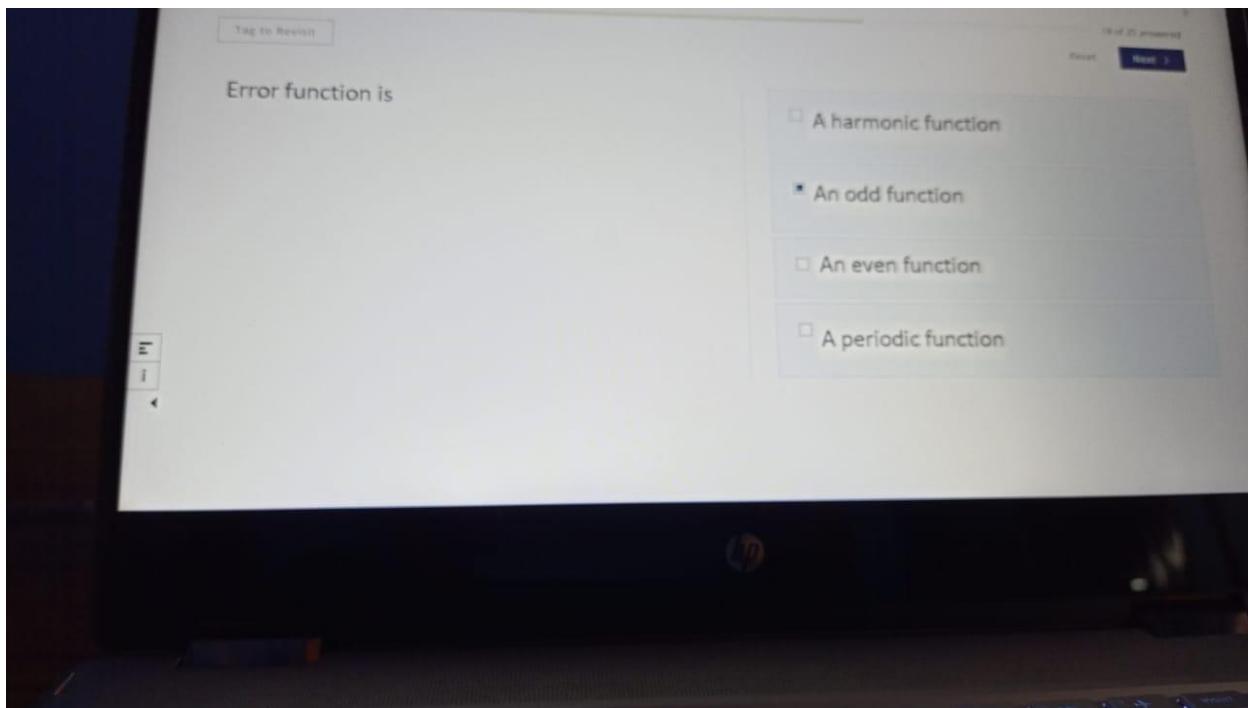
$\frac{\sqrt{\pi}}{4\sqrt{\log 3}}$

$\frac{\sqrt{\pi}}{\sqrt{\log 3}}$

None of the above

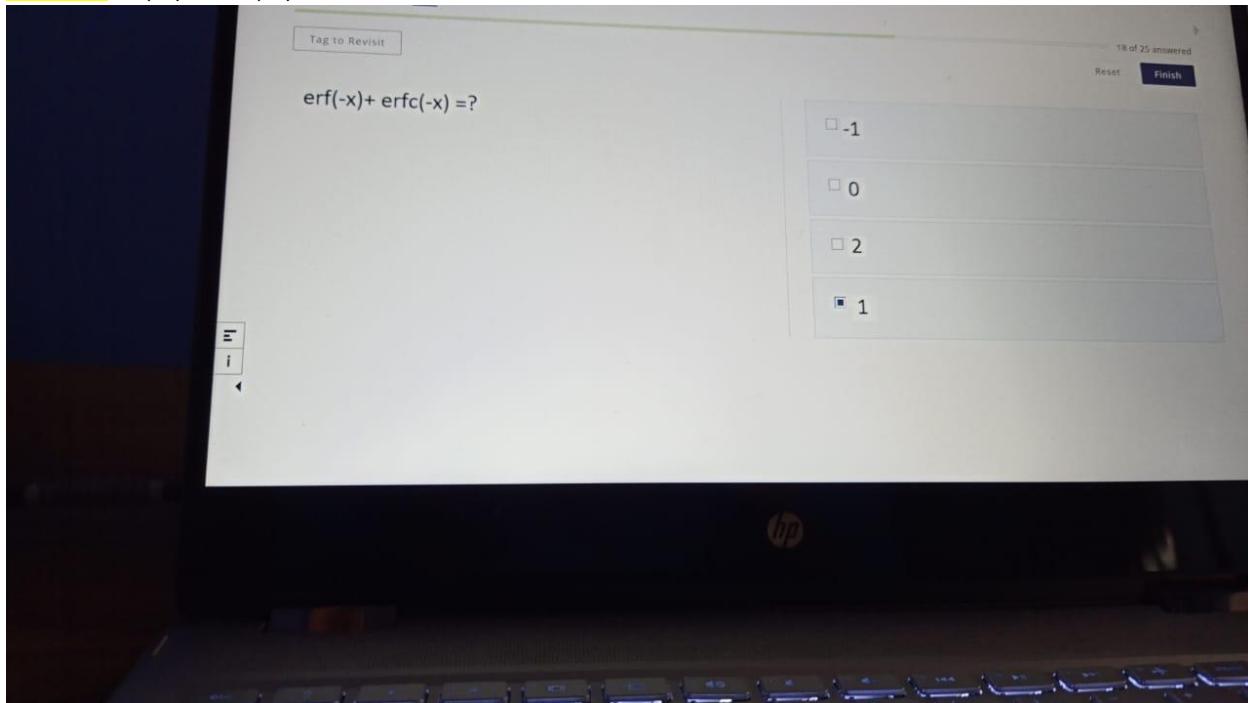
Ans: B

Unit 6 : Error Function is



Ans. Option B : An odd function

Unit 6 : $\text{erf}(-x) + \text{erfc}(-x) =$



.Ans. option D : 1

Unit 6: B (5/4,5/4) is equal to

$B\left(\frac{5}{4}, \frac{5}{4}\right)$ is equal to

$\frac{1}{\sqrt{\pi}} \left[\left(\frac{1}{4} \right)^2 \right]$

$\frac{2}{3\sqrt{\pi}} \left[\left(\frac{1}{4} \right) \right]$

$\frac{1}{12\sqrt{\pi}} \left[\left(\frac{1}{4} \right)^2 \right]$

$\frac{2}{3} \left[\left(\frac{1}{4} \right)^2 \right]$

Ans: C

UNIT 6: Using DUIS rule the value of the integral $e^{-ax} \sin ax/x dx$ from infinity to zero

Using DUIS Rule the value of the integral $\emptyset(\alpha) = \int_0^\infty \frac{e^{-ax} \sin ax}{x} dx$, with $\frac{d\emptyset}{d\alpha} = -\frac{1}{\alpha^2+1}$
and assuming $\int_0^\infty \frac{\sin x}{x} dx = \frac{\pi}{2}$ is

$\log(\alpha^2 + 1) + \frac{\pi}{2}$

$-\tan^{-1}\alpha + \frac{\pi}{2}$

$-\tan^{-1}\alpha$

$\tan^{-1}\alpha + \frac{\pi}{2}$

Ans: D

Unit:6 The value of $\int_0^\infty \frac{dx}{3^{4x^2}}$ is

The value of $\int_0^\infty \frac{dx}{3^{4x^2}}$ is

$\frac{\sqrt{\pi}}{3\sqrt{\log 4}}$

$\frac{\sqrt{\pi}}{4\sqrt{\log 3}}$

$\frac{\sqrt{\pi}}{\sqrt{\log 3}}$

None of the above

Ans: B

Unit: 7 (21 questions)

Unit:7 The Value of integral $x^2 yz dz$

The value of $\int_0^1 dx \int_0^2 dy \int_1^2 x^2 yz dz$

0

4

3

1

Ans: d (1)

Unit 7: The value of integral $r d\theta dr$

The value of $\int_{\theta=0}^{2\pi} \int_{r=0}^{1+\cos\theta} r d\theta dr$

3π

$\frac{3\pi}{2}$

0

$\frac{3\pi}{4}$

Ans: $3\pi/2$

Unit 7: The area of upper half of cardiode $r=a(1-\cos\theta)$ is given by following double integral

The area of upper half of cardiode $r=a(1-\cos\theta)$
is given by following double integral

$\int_0^\pi \int_0^{a(1-\cos\theta)} dr d\theta$

$\int_0^\pi \int_0^{a(1-\cos\theta)} r dr d\theta$

$\int_0^{2\pi} \int_0^{a(1-\cos\theta)} r dr d\theta$

$2 \int_0^\pi \int_0^a dr d\theta$

Ans: B

$\int_0^\pi \int_0^{a(1-\cos\theta)} r dr d\theta$

Unit 7: The value of integral $\int \int xy e^{x+y} dx dy$ is

The value of $\int \int xy e^{x+y} dx dy$ is

$(ye^y - e^y)(xe^x + e^x)$

$(ye^y - e^y)(xe^x - e^x)$

$ye^y(xe^x - e^x)$

$(ye^y - e^y)xe^x$

Ans:B

Unit 7 : The polar form of integral from 0 to a [$\sqrt{a^2-x^2}/\sqrt{ax-x^2}$] is

The polar form of $\int_0^a \int_{\sqrt{a^2-x^2}}^{\sqrt{a^2-x^2}} \frac{dy dx}{\sqrt{a^2-x^2-y^2}}$ is

$\int_{\theta=0}^{\pi/2} \int_{r=a \sin \theta}^a \frac{r d\theta dr}{\sqrt{a^2-r^2}}$

$\int_{\theta=0}^{\pi/2} \int_{r=a \cos \theta}^a \frac{r d\theta dr}{\sqrt{a^2-r^2}}$

$\int_{\theta=0}^{\pi/2} \int_{r=a \cos \theta}^a \frac{r d\theta dr}{\sqrt{a^2-r^2}}$

$\int_{\theta=0}^{\pi/4} \int_{r=a \cos \theta}^a \frac{r d\theta dr}{\sqrt{a^2-r^2}}$

Ans: D

Unit 7: The Value of the integral : dx dy

The value of the integral $\int_0^2 \int_0^{x^2} dx dy$

$e^2 - 1$

$3e^2 + 1$

$4e^2 + 1$

$e^2 + 1$

Ans: $e^2 - 1$

Unit 7: The value of $xydxdy$ over the rectangle bounded by $x=2, x=5, y=1, y=2$

The value of $\iint xydxdy$ over the rectangle bounded by $x = 2, x = 5, y = 1, y = 2$

63

36

$\frac{63}{4}$

$\frac{4}{63}$

Ans: 63/4

Unit:7 The value of area 4a to 0

The value of area = $\int_0^{4a} dy \int_{\frac{y^2}{4a}}^{\sqrt{4ay}} dx$

24

$\frac{8a^2}{3}$

a^2

$\frac{16a^2}{3}$

Ans: D

UNIT 7 The area bounded by the parabola $y^2=4ax$ And $x=a$ is

The area bounded by the parabola $y^2 = 4ax$ and $x = a$ is

$\frac{8a^2}{3}$

$8a^2$

$\frac{8a^2}{3}$

3

Ans:C($8a^2 / 3$)

Unit:7 If we put $x= r \cos \theta$, where r is annulus between

1 2 3 4 5

12 of 25 answered

Reset

Next >

If we put $x = r\cos\theta, y = r\sin\theta$. In $I = \iint_D \frac{x^2y^2}{x^2+y^2} dx dy$, where
 R is annulus between $x^2 + y^2 = 4$ and $x^2 + y^2 = 4$ then I is



$\int_{\theta=0}^{2\pi} \int_{r=1}^2 r^4 \sin^2\theta \cos^2\theta d\theta dr$

$\int_{\theta=0}^{2\pi} \int_{r=1}^2 r^3 \sin^2\theta \cos^2\theta d\theta dr$

$\int_{\theta=0}^{2\pi} \int_{r=1}^2 r^2 \sin^2\theta \cos^2\theta d\theta dr$

$\int_{\theta=0}^{2\pi} \int_{r=1}^2 r^4 \sin^2\theta \cos^2\theta d\theta dr$

Ans: question galat he but answer A hi hoga

UNIT 7: The value of $(x^2+y^2+z^2) dx dy dz$

The value of $\int_0^1 \int_0^1 \int_0^1 (x^2 + y^2 + z^2) dx dy dz$

 5

 12

 0

 6

Ans: 12

UNIT 7: If we change the order of integration then the new limits of x and y are

If $I = \int_0^a \int_y^a \frac{x}{x^2 + y^2} dx dy$, if we change the order of integration
then new limits of x and y are

$0 \leq x \leq a, 0 \leq y \leq a$

$0 \leq x \leq \frac{a}{2}, 0 \leq y \leq x$

$0 \leq x \leq \frac{a}{2}, 0 \leq y \leq \frac{a}{2}$

$0 \leq x \leq a, 0 \leq y \leq x$

Ans: D

UNIT 7 Where r is region bounded by $x^2 + y^2 - x = 0, y = 0, y > 0$ then polar form,

$\iint_R \frac{dx dy}{\sqrt{xy}}$ where R is region bounded by $x^2 + y^2 - x = 0, y = 0, y > 0$ then polar form,

$$\square \int_{\theta=0}^{\pi/2} \int_{r=0}^{\cos\theta} \frac{d\theta dr}{\sqrt{\sin\theta \cos\theta}}$$

$$\square \int_{\theta=0}^{\pi/2} \int_{r=0}^{\sin\theta} \frac{d\theta dr}{\sqrt{\sin\theta \cos\theta}}$$

$$\square \int_{\theta=0}^{\pi/2} \int_{r=0}^{\cos\theta} \frac{d\theta dr}{\sqrt{\sin\theta \cos\theta}}$$

$$\square \int_{\theta=0}^{\pi/2} \int_{r=1}^{\cos\theta} \frac{d\theta dr}{\sqrt{\sin\theta \cos\theta}}$$

Ans: c (best guess)[still not very sure]

Sauce

Soln

$$x^2 + y^2 - 2y = 0$$

$$x^2 + 1 + y^2 - 2y = 1$$

$x^2 + (y-1)^2 = 1$ Circle with center $(0,1)$
of radius 1

Note that Area of given

Region (R) = $\frac{1}{4}$ Area of given circle

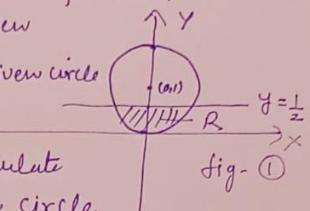


fig. ①

So, we have to calculate

Only Area of given circle

$$A = \iint dxdy = \iint r dr d\theta$$

$$\text{Now } x = r \cos \theta \quad y = r \sin \theta$$

$$r^2 - 2r \sin \theta = 0$$

$$r(r - 2 \sin \theta) = 0$$

$$\Rightarrow r=0 \text{ or } r=2 \sin \theta$$

$\therefore \theta$ moves 0 to π (∴ fig - ①)

$$\text{Now } \iint r dr d\theta = \int_0^\pi \int_{r=0}^{2 \sin \theta} r dr d\theta$$

$$= \frac{1}{2} \int_0^\pi [r^2]_{r=0}^{2 \sin \theta} d\theta$$

$$= 2 \int_0^\pi \sin^2 \theta d\theta = 2 \times 2 \times \frac{\pi}{4}$$

$$\text{Thus } \boxed{\text{Area}(R) = \frac{1}{4} \pi}$$

Unit 7 The value of $\int_0^\pi \int_0^x x \sin y dx dy$

The Value of $\int_0^\pi \int_0^x x \sin y dx dy$

π

$\frac{\pi^2}{2} + 2$

$\frac{\pi^2}{2} - 2$

$\frac{\pi^2}{2} - 4$

Ans: $\pi^2/2 + 2$

Unit7 The value of the integral $\int dz \int dy \int dx$ is

The value of the integral $\int_0^1 \int_0^y \int_0^x y \, dz \, dx \, dy$ is

1/4

1/8

1/3

1/5

Ans: $1/8$

Unit 7 The value of integral

The value of integral $\int_0^{\log 2} \int_0^x e^y \, dx \, dy$ is

$1 - \log 2$

$e^2 - \log 2$

$e - \log 2$

$2 - \log 2$

Ans: $1 - \log 2$

Unit 7 After change the order of integration, the double integral $dx dy$ will become

After change the order of integration, the double integral $\int_0^1 \int_{4y}^4 e^{x^2} dx dy$ will become

$\int_{y=1}^2 \int_{x=4y}^4 e^{x^2} dx dy$

$\int_{y=0}^1 \int_{x=4y}^4 e^{x^2} dx dy$

$\int_{y=0}^1 \int_{x=4y}^{4y} e^{x^2} dx dy$

$\int_{x=0}^4 \int_{y=0}^x e^{x^2} dx dy$

Ans: d

$\int_{x=0}^4 \int_{y=0}^x e^{x^2} dx dy$

Unit 7 If we change the order of integration then new limits of x and y are

If $I = \int_0^a \int_y^a \frac{x}{x^2 + y^2} dx dy$, if we change the order of integration then new limits of x and y are

$0 \leq x \leq \frac{a}{2}, 0 \leq y \leq \frac{a}{2}$

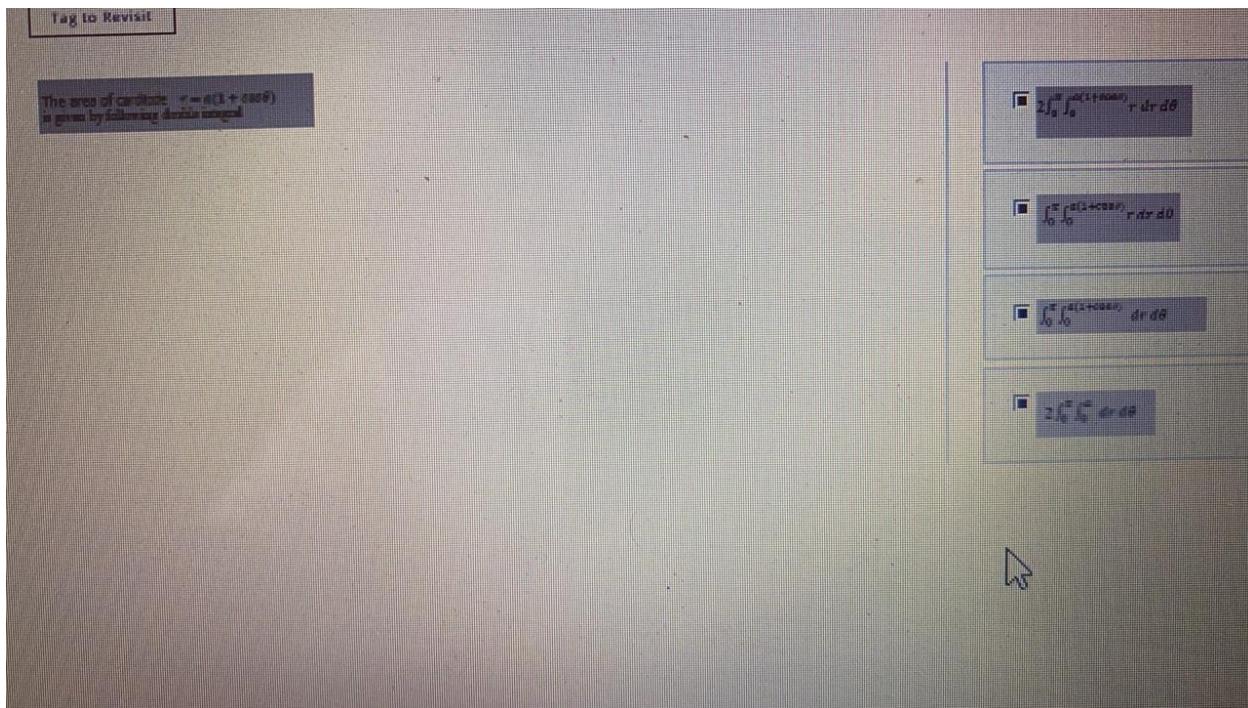
$0 \leq x \leq \frac{a}{2}, 0 \leq y \leq x$

$0 \leq x \leq a, 0 \leq y \leq x$

$0 \leq x \leq a, 0 \leq y \leq a$

Ans: c

Unit 7 The area of cardiode



Ans A

Unit 7: Area of the region bounded by $y=x$

Area of the region bounded by $y=x$, $y=1$, and y axis is
given by following double integral

$\int_0^1 \int_x^1 dx \, dy$

$\int_0^2 \int_0^x dx \, dy$

$\int_0^1 \int_y^1 dx \, dy$

$\int_0^1 \int_0^1 dx \, dy$

Ans: C

Unit 7: The value of $\sin\theta \, d\theta \, dr$

The value of $\int_{r=0}^a \int_{\theta=0}^{\pi} \int_{\phi=0}^{2\pi} r^2 \sin\theta d\theta d\phi dr$



- $8a^3 \frac{\pi}{2}$
- $2a^3 \frac{\pi}{2}$
- $4a^3 \frac{\pi}{2}$
- $a^3 \frac{\pi}{2}$

Ans B