((Q))2_SCOE// The D.E whose general solution is $y = Cx - C^2$, where c is arbitrary constant, is

((A))$\frac{dy}{dx} = C$

((B))$\left(\frac{dy}{dx}\right)^2 + xy = 0$

((C))$\left(\frac{dy}{dx}\right)^2 + x\frac{dy}{dx} - y = 0$

((D))$\left(\frac{dy}{dx}\right)^2 - x\frac{dy}{dx} + y = 0$

((E))D

((F))

((Q))2_SCOE// The D.E whose general solution is $y = C^2 + \frac{C}{x}$, where C is arbitrary constant, is

((A))$x^4y_1^2 + xy_1 - y = 0$

((B))$x^4y_1^2 - xy_1 - y = 0$

((C))$x^2y_1^2 - xy_1 - y = 0$

((D))$y_1 = -\frac{c}{x^2}$

((E))B

((F)))

((Q))2_SCOE// By eliminating arbitrary constant A the differential equation whose general solution is $y = 4(x - A)^2$

((A))$y_1^2 + 16y = 0$

((B))$y_1 - 2y = 0$

((C))$y_1^2 - 16y = 0$

((D))$y_1 - 8(x - A) = 0$

((E))C

((F)))

((Q))2_SCOE// By eliminating arbitrary constant a the differential equation whose general solution is $y^2 = 4ax$

((A))$xy\frac{dy}{dx} - y^2 = 0$

((B))$2xy\frac{dy}{dx} + y^2 = 0$

((C))$2xy\frac{dy}{dx} - y^2 = 0$

((D))$8xy\frac{dy}{dx} - y^2 = 0$

((E))C

((F)))

((Q))2_SCOE// The D.E whose general solution is $y = Acos(x+3)$, where A is arbitrary constant, is

((A))$cot(x+3)y_1 + y = 0$

((B))$tan(x+3)y_1 + y = 0$

((C))$cot(x+3)y_1 - y = 0$

((D))$tan(x+3)y_1 - y = 0$

((E))A

((F)))

((Q))2_SCOE/ The D.E representing the family of curves $y^2 = 2C(x + \sqrt{C})$ where C is arbitrary constant, is

((A))$2yy_1(x + \sqrt{yy_1}) - y^2 = 1$

((B))$2y_1(x + \sqrt{yy_1}) - y = 0$

((C))$y = 2y_1(x + \sqrt{C})$

((D))$y_1(x + \sqrt{yy_1}) - y = 0$

((E))B

((F)))

((Q))2_SCOE// The solution of the D.E.$\frac{dy}{dx} = \frac{1+y^2}{1+x^2}$ is

((A))$\tan^{-1} y = \tan^{-1} x + c$

((B))$\tan^{-1} x + \tan^{-1} y = c$

((C))$y - x = c$

((D))None of these

((E))A

((F)))

((Q))2_SCOE// The D.E. representing the family of curves $x^2 + y^2 = 2Ax$, where A is arbitrary constant, is

((A))$y_1 = \frac{y^2+x^2}{2xy}$

((B))$y_1 = \frac{y^2-x^2}{2xy}$

((C))$y_1 = \frac{y^2+x^2}{2y}$

((D))$y_1 = \frac{2xy}{y^2+x^2}$

((E))B

((F)))

((Q))2_SCOE// The D.E. satisfied by general solution
$y = A\cos x + B\sin x$,where A,B are arbitrary constants,is

((A))$\frac{d^2y}{dx^2} + \frac{dy}{dx} = B\sin x$

((B))$\frac{d^2y}{dx^2} - y = 0$

((C))$\frac{d^2y}{dx^2} + \frac{dy}{dx} = A\cos x$

((D))$\frac{d^2y}{dx^2} + y = 0$

((E))D

((F)))

((Q))2_SCOE// The D.E. satisfied by general solution
$y = A\cos(\log x) + B\sin(\log x)$,where A,B are arbitrary constants, is

((A))$x\frac{d^2y}{dx^2} + \frac{dy}{dx} + y = 0$

((B))$x^2\frac{d^2y}{dx^2} + \frac{dy}{dx} + y = 0$

((C))$x^2\frac{d^2y}{dx^2} + \frac{dy}{dx} - y = 0$

((D))$x^2\frac{d^2y}{dx^2} + y = 0$

((E))B

((F)))

((Q))2_SCOE// The D.E. satisfied by general solution
$y = Ae^x + Be^{-x}$,where A,B are arbitrary constants, is

((A))$y_2 - y = 0$

((B))$\mathrm{y}_2 + \mathrm{y} = 0$

((C))$\mathrm{y}_2 + \mathrm{y} = Ae^x + Be^{-x}$

((D))$y_2 - y = 2Ae^x$

((E))A

((F)))

((Q))2_SCOE// The D.E. satisfied by general solution
$y^2 = 4A(x - B)$,where A,B are arbitrary constants, is

((A))$\mathrm{y}_2 + \mathrm{y}_1^2 = 0$

((B))$\mathrm{yy}_2 + \mathrm{y}_1 = 0$

((C))$yy_2 - y_1^2 = 0$

((D))$yy_2 + y_1^2 = 0$

((E))D

((F)))

((Q))2_SCOE// The D.E. of family of circles having their center at $(A, 5)$ and radius 5,where A is arbitrary constant is

((A))$(y-5)^2\left\{1+\frac{dy}{dx}\right\} = 5$

((B))$(y-5)^2\left\{1-\left(\frac{dy}{dx}\right)^2\right\} = 25$

((C))$(y-5)^2\left\{1+\left(\frac{dy}{dx}\right)^2\right\} = 25$

((D))None of these

((E))C

((F)))

((Q))2_SCOE// The D.E. satisfied by general solution $(x-A)^2 = 4(y-B)$,where A,B are arbitrary constants, is

((A))$2\frac{dy}{dx} - (x-A) = 0$

((B))$\frac{d^2y}{dx^2} + \frac{1}{2} = 0$

((C))$\frac{d^2y}{dx^2} - \frac{1}{2} = 0$

((D))$\frac{d^2y}{dx^2} - 2 = 0$

((E))C

((F)))

((Q))2_SCOE// The D.E. of family of circles having their center at origin and radius a, where a is arbitrary constant is

((A))$x - y\frac{dy}{dx} = 0$

((B))$x + y\frac{dy}{dx} = 0$

((C))$x\frac{dy}{dx} + y = 0$

((D))$x + y\frac{dy}{dx} = \frac{a^2}{2}$

((E))B

((F)))

((Q))2_SCOE// The D.E. satisfied by general solution $y = Ax^2 + Bx + C$,where

A,B, C are arbitrary constants, is

((A))$\frac{d^3y}{dx^3} = 0$

((B))$\frac{d^3y}{dx^3} = A$

((C))$\frac{d^2y}{dx^2} = 2A$

((D))$\frac{d^4y}{dx^4} = 0$

((E))A

((F)))

((Q4))2_SCOE// The differential equation whose general solution is xy = c^2, c is arbitrary constant, is

((A))xy_1-y=0

((B))xy_2+y_1=0

((C))$xy_1=c^2$

((D))xy_{1+}y=0

((E))d

((F))$xy_{1+}y=0$

((Q7))2_SCOE// The differential equation representing the family of curves $x^2 + y^2 = 2Ax$, where A is arbitrary constant, is

((A))$y_1 = \frac{y^2+x^2}{2xy}$

((B))$y_1 = \frac{y^2-x^2}{2xy}$

((C))$y_1 = \frac{y^2+x^2}{2y}$

((D))$y_1 = \frac{2xy}{y^2-x^2}$

((E))b

((F))$y_1 = \frac{y^2-x^2}{2xy}$

((Q8))2_SCOE//$By\ eliminating$ arbitrary constant A the differential equation whose general solution is $y^2 = x^2 - 1 + Ax$ is

((A))$2xy\frac{dy}{dx} = x^2+y^2+1$

((B))$2xy\frac{dy}{dx} = x^2+y^2+1+x$

((C))$2xy\frac{dy}{dx} = y^2+1$

((D))$2y\frac{dy}{dx} = 2x+A$

((E))a

((F))2xy$\frac{dy}{dx}$ = x^2+y^2+1

((Q9))2_SCOE// The differential equation satisfied by general solution y=Ae^{x}+Be^{-x} , where A & B are arbitrary constants, is

((A))y_2-y=0

((B))y_2+y=0

((C))y_2-y= Ae^{x}-Be^{-x}

((D))y_2-y= 2Ae^{x}

((E))a

((F))y_2-y=0

((Q10))2_SCOE//The differential equation satisfied by general solution xy=Ae^{x}+Be^{-x} , where A & B are arbitrary constants, is

((A))xy_2+2y_1+xy=0

((B))xy_2-2y_1+xy=0

((C))xy_2+2y_1-xy=0

((D))xy_2+y_1-xy=0

((E))c

((F))xy_2+2y_1-xy=0

((Q11))2_SCOE// $By\ eliminating$ arbitrary constants A & B the differential equation whose general solution is e^{-t}x=(A+Bt) is

((A))x_2+2x_1-x=0

((B))x_2-2x_1+x=0

((C))x_2-x_1+x=0

((D))x_2+x=0

((E))b

((F))x_2-2x_1+x=0

((Q12))2_SCOE// $By\ eliminating$ arbitrary constants A & B the differential equation whose general solution is $y^2=4A(x-B)$ is

((A))$y_2+(y_1)^2=0$

((B))$yy_2+y_1=0$

((C))$yy_2-(y_1)^2=0$

((D))$yy_2+(y_1)^2=0$

((E))d

((F))$yy_2+(y_1)^2=0$

((Q13))2_SCOE// By eliminating arbitrary constants the DE for equation $y = Ae^{-x^2}$ is

((A)) $\frac{dy}{dx} - 2xy = 0$

((B)) $y\frac{dy}{dx} - 2x = 0$

((C)) $\frac{dy}{dx} + 2xy = 0$

((D)) $y\frac{dy}{dx} + 2x = 0$

((E))c

((F)) $\frac{dy}{dx} + 2xy = 0$

((Q14))2_SCOE// The DE satisfied by general solution $y = A\cos\frac{2}{3}x + B\sin\frac{2}{3}x$

Where A & B are arbitrary constants, is

((A)) $\frac{d^2y}{dx^2} + \frac{9}{4}y = 0$

((B)) $\frac{d^2y}{dx^2} - \frac{9}{4}y = 0$

((C)) $\frac{d^2y}{dx^2} + \frac{4}{9}y = 0$

((D)) $\frac{d^2y}{dx^2} - \frac{4}{9}y = 0$

((E))c

((F)) $\frac{d^2y}{dx^2} + \frac{4}{9}y = 0$

((Q15))2_SCOE// The DE whose general solution is $y = \sqrt{5x + c}$,

((A))a) $2y\frac{dy}{dx} - 1 = 0$

((B)) $2y\frac{dy}{dx} - 5 = 0$

((C)) $\frac{dy}{dx} - \frac{5}{2}\frac{1}{\sqrt{5x + c}} = 0$

((D)) $2y\frac{dy}{dx} - 1 = 0$

((E))b

((F)) $2y\frac{dy}{dx} - 5 = 0$

((Q17))2_SCOE// The differential equation of family of curves $y^2 = 4a(x + a)$ where a is an arbitrary constant is

((A))y $\left[1 + \left(\frac{dy}{dx}\right)^2\right] = 2x\frac{dy}{dx}$

((B))y $\left[1 - \left(\frac{dy}{dx}\right)^2\right] = 2x\frac{dy}{dx}$

((C)) $\frac{d^2y}{dx^2} + 2\frac{dy}{dx} = 0$

((D))$\left(\frac{dy}{dx}\right)^3 + 3\frac{dy}{dx} + y = 0$

((E))b

((F))y $\left[1 - \left(\frac{dy}{dx}\right)^2\right] = 2x\ \frac{dy}{dx}$

((Q18))2_SCOE// The solution of $xe^{-x^2}\,dx + \sin y\,dy = 0$ is

((A))$e^{-x^2} - 2\sin y = c$

((B))$-e^{-x^2} + \cos y = c$

((C))$e^{-x^2} + 2\cos y = c$

((D))$e^{-x^2} + \cos y = c$

((E))c

((F))$e^{-x^2} + 2\cos y = c$

((Q41))2_SCOE// The equation of the curve which satisfies the DE $(1 + y^2)\,dx - xydy = 0$ is

((A))$x^2 + y^2 = c^2$

((B))$2x^2 + y^2 = c^2$

((C))$x^2 + 2y^2 = 0$

((D)) $x^2 - cy^2 = c$

((E))d

((F)) $x^2 - cy^2 = c$

((Q42))2_SCOE// The DE of family of curves y = a cos □x + b sin □x where a and b are arbitrary constants is given by

((A))$\frac{d^2y}{dx^2} + \square y = 0$

((B))$\frac{d^2y}{dx^2} - \square^2 y = 0$

((C))$\frac{d^2y}{dx^2} + y = 0$

((D)) $\frac{d^2y}{dx^2} + \square^2 y = 0$

((E))d

((F)) $\frac{d^2y}{dx^2} + \square^2 y = 0$

((Q43))2_SCOE// The solution of the DE log $\frac{dy}{dx} = x + y$ is

((A))$e^x + e^{-y} = c$

((B))$e^x - e^y = c$

((C))$e^{-x} + e^{-y} = c$

((D))$e^{-x} + e^y = c$

((E))a

((F))$e^x + e^{-y} = c$

((Q44))2_SCOE// The DE of family of curves $Ax^2 + By^2 = 1$ is

((A))$x \frac{d^2y}{dx^2} + xy \frac{dy}{dx} + y \frac{dy}{dx} = 0$

((B))$x \frac{d^2y}{dx^2} - xy \frac{dy}{dx} + y = 0$

((C))$xy \frac{d^2y}{dx^2} + x \left(\frac{dy}{dx}\right)^2 - y \frac{dy}{dx} = 0$

((D))$x \frac{d^2y}{dx^2} - x \frac{dy}{dx} + y = 0$

((E))c

((F))$xy \frac{d^2y}{dx^2} + x \left(\frac{dy}{dx}\right)^2 - y \frac{dy}{dx} = 0$

((Q45))2_SCOE// The solution of $\frac{dy}{dx} + \frac{2}{x} y = 5x^2$ is

((A))$y = x^3 + \frac{c}{x^2}$

((B))$y = x^2 + cx^3$

((C))$y = x^2 + \frac{c}{x^3}$

((D))$y = x + cx^2$

((E))a

((F))$y = x^3 + \frac{c}{x^2}$

((Q46))2_SCOE// Find the DE which has $y = c_1e^x + c_2e^{-x} + 3x$ as its general solution.

((A))$\frac{d^2y}{dx^2} - 3x + y = 0$

((B))$\frac{d^2y}{dx^2} + 3x + y = 0$

((C))$\frac{d^2y}{dx^2} - 3x - y = 0$

((D))$\frac{d^2y}{dx^2} + 3x - y = 0$

((E))d

((F))$\frac{d^2y}{dx^2} + 3x - y = 0$

((Q48))2_SCOE//The DE represented by the family of straight lines through the origin is

((A))$y = x \frac{dy}{dx}$

((B))$x \frac{dy}{dx} + y = 0$

((C))$xy + \frac{dy}{dx} = 0$

((D))$x + x \frac{dy}{dx} = 0$

((E))a

((F))$y = x \frac{dy}{dx}$

((Q49))2_SCOE// The DE formed by eliminating the arbitrary constants from

$x = (c_1 + c_2 t)\, e^t$ is

((A))$\frac{d^2x}{dt^2} - 2\frac{dx}{dt} + x = 0$

((B))$\frac{d^2x}{dt^2} + 2\frac{dx}{dt} - x = 0$

((C))$\frac{d^2x}{dt^2} - 2\frac{dx}{dt} - x = 0$

((D))$\frac{d^2x}{dt^2} + 2\frac{dx}{dt} + x = 0$

((E))a

((F))$\frac{d^2x}{dt^2} - 2\frac{dx}{dt} + x = 0$

((Q))2_SCOE// The differential equation whose general solution is $y = \sqrt{5x + C}$ where C is arbitrary constant, is

((A))$2y\frac{dy}{dx} - 1 = 0$

((B))$2y\frac{dy}{dx} - 5 = 0$

((C))$\frac{dy}{dx} - \frac{5}{2}\frac{1}{\sqrt{5x+C}} = 0$

((D))$y\frac{dy}{dx} - 5 = 0$

((E))B

((F))

((Q))2_SCOE// The differential equation whose general solution is $y = Cx - C^2$, where c is arbitrary constant, is

((A))$\frac{dy}{dx} = C$

((B))$\left(\frac{dy}{dx}\right)^2 + xy = 0$

((C))$\left(\frac{dy}{dx}\right)^2 + x\frac{dy}{dx} - y = 0$

((D))$\left(\frac{dy}{dx}\right)^2 - x\frac{dy}{dx} + y = 0$

((E))D

((F))

((Q))2_SCOE// The differential equation whose general solution is $y = C^2 + \frac{C}{x}$ where C is arbitrary constant, is

((A))$x^4y_1^2 + xy_1 - y = 0$

((B))$x^4y_1^2 - xy_1 - y = 0$

((C))$x^2y_1^2 - xy_1 - y = 0$

((D))$y_1 = -\frac{c}{x^2}$

((E))B

((F))

((Q))2_SCOE// By eliminating arbitrary constant A the differential equation whose general solution is $y = 4(x - A)^2$

((A))$y_1^2 + 16y = 0$

((B))$y_1 - 2x = 0$

((C))$y_1^2 - 16y = 0$

((D))$y_1 - 8(x - A) = 0$

((E))C

((F))

((Q))2_SCOE// By eliminating arbitrary constant a the differential equation whose general solution is $y^2 = 4ax$

((A))$xy\frac{dy}{dx} - y^2 = 0$

((B))$2xy\frac{dy}{dx} + y^2 = 0$

((C))$2xy\frac{dy}{dx} - (\square)^2 = 0$

((D))$8xy\frac{dy}{dx} - y^2 = 0$

((E))C

((F))

((Q))2_SCOE// The differential equation whose general solution is $xy = C^2$, where C is arbitrary constant, is

((A))$xy_1 - y = 0$

((B))$xy_2 + y_1 = 0$

((C))$xy_1 = C^2$

((D))$xy_1 + y = 0$

((E))D

((F))

((Q))2_SCOE// The differential equation whose general solution is $y = Acos(x + 3)$, where A is arbitrary constant, is

((A))$cot(x + 3)y_1 + y = 0$

((B))$tan(x + 3)y_1 + y = 0$

((C))$cot(x + 3)y_1 - y = 0$

((D))$tan(x + 3)y_1 - y = 0$

((E))A

((F))

((Q))2_SCOE// The differential equation representing the family of curves $y^2 = 2C(x+\sqrt{C})$ where C is arbitrary constant, is

((A))$2yy_1(x+\sqrt{yy_1})-y^2=1$

((B))$2y_1(x+\sqrt{yy_1})-y=0$

((C))$y=2y_1(x+\sqrt{C})$

((D))$y_1(x+\sqrt{yy_1})-y=0$

((E))B

((F))

((Q))2_SCOE// The differential equation representing the family of curves $x^2+y^2=2Ax$, where A is arbitrary constant,is

((A))$y_1=\frac{y^2+x^2}{2xy}$

((B))$y_1=\frac{y^2-x^2}{2xy}$

((C))$y_1=\frac{y^2+x^2}{2y}$

((D))$y_1=\frac{2xy}{y^2+x^2}$

((E))B

((F))

((Q))2_SCOE// The differential equation satisfied by general solution $y=A\cos x+B\sin x$, where A, B are arbitrary constants, is

((A))$\frac{d^2y}{dx^2}+\frac{dy}{dx}=B\sin x$

((B))$\frac{d^2y}{dx^2}-y=0$

((C))$\frac{d^2y}{dx^2}+\frac{dy}{dx}=A\cos x$

((D))$\frac{d^2y}{dx^2}+y=0$

((E))D

((F))

((Q))2_SCOE// The differential equation satisfied by general solution $y = A\cos(\log x) + B\sin(\log x)$, where A, B are arbitrary constants, is

((A))$x\frac{d^2y}{dx^2} + \frac{dy}{dx} + y = 0$

((B))$x^2\frac{d^2y}{dx^2} + \frac{dy}{dx} + y = 0$

((C))$x^2\frac{d^2y}{dx^2} + \frac{dy}{dx} - y = 0$

((D))$x^2\frac{d^2y}{dx^2} + y = 0$

((E))B

((F))

((Q))2_SCOE// The differential equation satisfied by general solution $y = Ae^x + Be^{-x}$, where A, B are arbitrary constants, is

((A))$y_2 - y = 0$

((B))$\mathrm{y}_2 + \mathrm{y} = 0$

((C))$\mathrm{y}_2 + \mathrm{y} = Ae^x + Be^{-x}$

((D))$y_2 - \square = 2Ae^x$

((E))A

((F))

((Q))2_SCOE// The differential equation satisfied by general solution $y^2 = 4A(x - B)$, where A, B are arbitrary constants, is

((A))$\mathrm{y}_2 + \mathrm{y}_1^2 = 0$

((B))$\mathrm{y}\mathrm{y}_2 + \mathrm{y}_1 = 0$

((C))$\mathrm{y}\mathrm{y}_2 - \mathrm{y}_1^2 = 0$

((D))$\mathrm{y}\mathrm{y}_2 + \mathrm{y}_1^2 = 0$

((E))D

((F))

((Q))2_SCOE// The differential equation of family of circles having their center at $(A, 5)$ and radius 5, where A is arbitrary constant is

((A))$(y-5)^2\left\{1+\frac{dy}{dx}\right\}=5$

((B))$(y-5)^2\left\{1-\left(\frac{dy}{dx}\right)^2\right\}=25$

((C))$(y-5)^2\left\{1+\left(\frac{dy}{dx}\right)^2\right\}=25$

((D))None of these

((E))C

((F))

((Q))2_SCOE// The differential equation satisfied by general solution $(x-A)^2=4(y-B)$, where A, B are arbitrary constants, is

((A))$2\frac{dy}{dx}-(x-A)=0$

((B))$\frac{d^2y}{dx^2}+\frac{1}{2}=0$

((C))$\frac{d^2y}{dx^2}-\frac{1}{2}=0$

((D))$\frac{d^2y}{dx^2}-2=0$

((E))C

((F))

((Q))2_SCOE// The differential equation of family of circles having their center at origin and radius a, where a is arbitrary constant is

((A))$x-y\frac{dy}{dx}=0$

((B))$x+y\frac{dy}{dx}=0$

((C))$\boldsymbol{x\frac{dy}{dx}+y=0}$

((D))$\boldsymbol{x+y\frac{dy}{dx}=\frac{a^2}{2}}$

((E))B

((F))

((Q))2_SCOE// The differential equation satisfied by general solution $\boldsymbol{y=Ax^2+Bx+C}$, where A,B, C are arbitrary constants, is

((A))$\boldsymbol{\frac{d^3y}{dx^3}=0}$

((B))$\boldsymbol{\frac{d^3y}{dx^3}=A}$

((C))$\boldsymbol{\frac{d^2y}{dx^2}=2A}$

((D))$\boldsymbol{\frac{d^4y}{dx^4}=0}$

((E))A

((F))

((Q))2_SCOE// The solution of D.E. $\frac{dy}{dx}+\sqrt{\frac{1-y^2}{1-x^2}}=0$

((A))$\tan^{-1}x+\cot^{-1}y=C$

((B))$\sin^{-1}x+\sin^{-1}y=C$

((C))$\sec^{-1}x+cosec^{-1}x=C$

((D))$\sin^{-1}x-\sin^{-1}y=C$

((E))B

((F)))

((Q))2_SCOE// The value of λ for which the D.E. $(xy^2+\lambda x^2y)dx+(x^3+x^2y)dy=0$ is exact is

((A))-3

((B))2

((C))3

((D))1

((E))D

((F)))

((Q))2_SCOE// The D.E.$(ay^2 + x + x^8)dx + (y^8 - y + bxy)dy = 0$ is exact if

((A))$b \neq 2a$

((B))$b = a$

((C))$a = 1, b = 3$

((D))$b = 2a$

((E))D

((F)))

((Q))2_SCOE// The D.E.$(3 + by \cos x\ )dx + (2 \sin x - 4y^3)dy = 0$ is exact if

((A))$b = -2$

((B))$b = 3$

((C))$b = 0$

((D))$b = 2$

((E))D

((F)))

((Q))2_SCOE// I.F. of homogeneous D.E. $(xy - 2y^2)dx + (3xy - x^2)dy = 0$ is

((A))$\frac{1}{xy}$

((B))$\frac{1}{x^2y^2}$

((C))$\frac{1}{x^2y}$

((D))$\frac{1}{xy^2}$

((E))D

((F)))

((Q))2_SCOE// I.F. of D.E. $(1 + xy)ydx + (x^2y^2 + xy + 1)xdy = 0$ is

((A))$\frac{1}{x^2y}$

((B))$-\frac{1}{x^3y^3}$

((C))$\frac{1}{xy^2}$

((D))$\frac{1}{x^2y^2}$

((E))B

((F)))

((Q))2_SCOE// I.F. of D.E. $(x^2 + y^2 + x)dx + (xy)dy = 0$ is
((A))$\frac{1}{x}$

((B))$\frac{1}{x^2}$

((C))x^2

((D))x

((E))D

((F)))

((Q))2_SCOE// I.F. of D.E. $\left(y + \frac{y^3}{3} + \frac{x^2}{2}\right)dx + \left(\frac{x+xy^2}{4}\right)dy = 0$ is

((A))$\frac{1}{x}$

((B))x^3

((C))x^2

((D))$\frac{1}{x^3}$

((E))B

((F)))

((Q))2_SCOE// I.F. of D.E. $(2x\log x - xy)dy + (2y)dx = 0$ is

((A))$\frac{1}{x}$

((B))$\frac{1}{x^2y^2}$

((C))$\frac{1}{x^2}$

((D))$\frac{1}{y}$

((E))A

((F)))

((Q))2_SCOE// I.F. of D.E. $(2xy^2 + ye^x)dx - e^x dy = 0$

((A))$\frac{1}{x}$

((B))$\frac{1}{y}$

((C))$\frac{1}{x^2}$

((D))$\frac{1}{y^2}$

((E))D

((F)))

((Q))2_SCOE// I.F. of D.E. $(y^4 + 2y)dx + (xy^3 + 2y^4 - 4x)dy = 0$

((A))$\frac{2}{x}$

((B))$\frac{1}{y}$

((C))$\frac{1}{y^3}$

((D))$\frac{2}{y^2}$

((E))C

((F)))

((Q))2_SCOE// Solution of non—exact D.E. $(x^2 - 3xy + 2y^2)dx + x(3x - 2y)dy = 0$ With I.F. $\frac{1}{x^3}$ is

((A))$3\frac{y}{x} - \frac{y^2}{x^2} = C$

((B))$\log x - 3\frac{y}{x} + \frac{y^2}{x^2} = C$

((C))$\log x + 3\frac{y}{x} - 2\frac{y^2}{x^2} = C$

((D))$\log x + 3\frac{y}{x} - \frac{y^2}{x^2} = C$

((E))D

((F)))

((Q))2_SCOE// Solution of non—exact D.E. $(3xy^2 - y^3)dx + (xy^2 - 2x^2y)dy = 0$ With I.F. $\frac{1}{x^2y^2}$ is

((A))$3\log x - \frac{2y}{x^3} - 2\log y = C$

((B))$3\log x + \frac{y}{x} - 2\log y = C$

((C))$3\log x + \frac{y}{x} = C$

((D))$\log x - \frac{y}{x} + 2\log y = C$

((E))B

((F)))

((Q))2_SCOE// Solution of non—exact D.E. $(x^4e^x - 2mxy^2)dx + (2mx^2y)dy = 0$ With I.F. $\frac{1}{x^4}$ is

((A))$e^x + \frac{6my^2}{x^4} = C$

((B))$e^x + \frac{2my^2}{x^2} = C$

((C))$e^x + \frac{y^2}{x^2} = C$

((D))$e^x + \frac{my^2}{x^2} = C$

((E))D

((F)))

((Q21))2_SCOE// Which of the following DE are separable.

(i) $\frac{dy}{dx} = xy$ (ii) $\frac{dy}{dx} = x + y$ (iii) $\frac{dy}{dx} = xy + y$

((A))All three are separable

((B))Equation (i) only

((C))Equations (i) and (iii) only

((D))Equation (ii) only

((E))c

((F))Equations (i) and (iii) only

((Q23))2_SCOE//The general solution of the DE x dy = y dx is a family of

((A))Circles

((B))Ellipse

((C))Parallel lines

((D))Lines passing through the origin

((E))d

((F))Lines passing through the origin

((Q24))2_SCOE// The substitution that transforms the DE $\frac{dy}{dx}=\frac{x+y+1}{2x+2y+3}$ to the homogeneous form is

((A))x – y = u

((B))x + y = u

((C))$\frac{y}{x}$ = u

((D))$\frac{x}{y}$ = u

((E))b

((F))x + y = u

((Q25))2_SCOE// The equation of the curve passing through (3, 9) which satisfies the DE $\frac{dy}{dx}=x+\frac{1}{x^2}$ is

((A))6xy = $3x^2$+6x + 6

((B))6xy = $3x^2$ – 29x + 29

((C))6xy = $3x^3$ + 29x – 6

((D))6xy = $3x^2$ – 6x + 29

((E))c

((F))6xy = $3x^3$ + 29x – 6

((Q26))2_SCOE// The DE representing the family of curves y^2 = 2c $\left(x+\sqrt{c}\right)$where c is a positive parameter is of

((A))order 1 and degree 2

((B))order 2 and degree 1

((C))order 1 and degree 3

((D))order 2 and degree 4

((E))c

((F))order 1 and degree 3

((Q27))2_SCOE// The solution of $\frac{dy}{dx} = \frac{x - y + 3}{2x - 2y + 5}$ is

((A))2x – y + log (x + y + 2) = c

((B))x + 2y – log (x + y + 2) = c

((C))x – 2y + log (x – y + 2) = c

((D))2x + y – log (x – y + 2) = c

((E))c

((F))x – 2y + log (x – y + 2) = c

((Q28))2_SCOE// The solution of the DE $2x \frac{dy}{dx} - y = 3$ represents.

((A))Circles

((B))Ellipses

((C))Hyperbolas

((D))Parabolas

((E))d

((F))Parabolas

((Q31))2_SCOE// The first order DE of the family of circles of fixed radius r, with centre on the X–axis, is

((A))$y^2 \left(\frac{dy}{dx}\right)^2 + y^2 = r^2$

((B))$y^2 + \left(\frac{dy}{dx}\right)^2 = r^2$

((C))$x^2 \left(\frac{dy}{dx}\right)^2 - y^2 = r^2$

((D))$y^2 - \left(\frac{dy}{dx}\right)^2 = r^2$

((E))a

((F))$y^2 \left(\frac{dy}{dx}\right)^2 + y^2 = r^2$

((Q35))2_SCOE// Which of the following DE are separable.

(i) $\frac{dy}{dx} = xy$ (ii) $\frac{dy}{dx} = x + y$ (iii) $\frac{dy}{dx} = xy + y$

((A))All three are separable

((B))Equation (i) only

((C))Equations (i) and (iii) only

((D))Equation (ii) only

((E))c

((F))Equations (i) and (iii) only

((Q36))2_SCOE// $y = cx - c^2$ is the general solution of the DE

((A))$\left(\frac{dy}{dx}\right)^2 - x\frac{dy}{dx} + y = 0$

((B))$\frac{d^2y}{dx^2} = 0$

((C))$\frac{dy}{dx} = c$

((D))$\left(\frac{dy}{dx}\right)^2 + x\frac{dy}{dx} + y = 0$

((E))a

((F))$\left(\frac{dy}{dx}\right)^2 - x\frac{dy}{dx} + y = 0$

((Q37))2_SCOE// The solution of $(x + y – 1)\, dx + (2x + 2y – 3)\, dy = 0$ is

((A))$y – x + \log (x + y – 2) = c$

((B))$2x – y + \log (x + y – 2) = c$

((C))$x + 2y + \log (x + y – 2) = c$

((D))$2x + 2y + \log (x + y – 2) = c$

((E))c

((F))$x + 2y + \log (x + y – 2) = c$

((Q38))2_SCOE// If $\frac{dy}{dx} + \frac{1}{\sqrt{1-x^2}} = 0$ then the solution is

((A))$y^2 + 2 \sin^{-1} x = c$

((B))$x + \sin^{-1} y = c$

((C))$x^2 + 2 \sin^{-1} y = 0$

((D))$y + \sin^{-1}x = c$

((E))d

((F))$y + \sin^{-1}x = c$

((Q))2_SCOE// The general solution of differential equation $\frac{dy}{dx} = e^{x-y} + x^2e^{-y}$ is

((A))$e^x = x^2 + c$

((B))$e^{x-y} = x^3 + c$

((C))$e^y = e^x + \frac{x^3}{3} + c$

((D))$y^2 = e^x - \frac{x^3}{3} + c$

((E))C

((F))

((Q))2_SCOE// The general solution of differential equation $\sec^2 x \tan y\, dx + \sec^2 y \tan x\, dy = 0$ is

((A))$\tan^2 x + \tan^2 y = c$

((B))$\tan x \tan y = c$

((C))$\sec^2 x \tan y + \sec^2 y \tan x = c$

((D))$\sec^2 x \sec^2 y = c$

((E))B

((F))

((Q))2_SCOE// The substitution for reducing non-homogeneous differential equation $\frac{dy}{dx} = \frac{2x-5y+3}{2x+4y-6}$ to homogeneous differential equation is

((A))$x = X + 1,\ y = Y - 3$

((B))$x = X + 2,\ y = Y + 2$

((C))$x = X + 1,\ y = Y + 1$

((D))$x = X - 1,\ y = Y + 2$

((E))C

((F))

((Q))2_SCOE// The general solution of the exact differential equation $\frac{dy}{dx} = \frac{2x-3y+1}{3x+4y-5}$ is

((A))$x^2 + 3xy + x - 2y^2 + 5y = c$

((B))$x^2 - 3xy + x - 2y^2 + 5y = c$

((C))$x^2 - 3xy - x + 2y^2 + 5y = c$

((D))None of these

((E))B

((F))

((Q))2_SCOE// The substitution for reducing non-homogeneous differential equation $\frac{dy}{dx} = \frac{-x-2y}{y-1}$ to homogeneous differential equation is

((A))$x = X - 1,\ y = Y - 3$

((B))$x = X - 2,\ y = Y + 1$

((C))$x = X + 1,\ y = Y + 1$

((D))$x = X - 1,\ y = Y + 2$

((E))B

((F))

((Q))2_SCOE// The solution of the differential equation$\frac{dy}{dx} = \frac{1+y^2}{1+x^2}$ is

((A))$\tan^{-1} y = \tan^{-1} x + c$

((B))$\tan^{-1} x + \tan^{-1} y = c$

((C))$y - x = c$

((D))None of these

((E))A

((F))

((Q))2_SCOE// The solution of differential equation $\boldsymbol{x^3\left(x\frac{dy}{dx} + y\right) - sec(xy) = 0}$ is

((A))$\mathbf{tan}(\boldsymbol{xy}) + \frac{\mathbf{1}}{\mathbf{2}\boldsymbol{x}^{\mathbf{2}}} = \boldsymbol{C}$

((B))$\mathbf{sin}(\boldsymbol{xy}) + \frac{\mathbf{1}}{\mathbf{2}\boldsymbol{x}^{\mathbf{2}}} = \boldsymbol{C}$

((C))$\mathbf{sin}(\boldsymbol{xy}) - \frac{\mathbf{1}}{\mathbf{2}\boldsymbol{x}^{\mathbf{2}}} = \boldsymbol{C}$

((D))$\mathbf{sin}(\boldsymbol{xy}) - \frac{\mathbf{1}}{\mathbf{4}\boldsymbol{x}^{\mathbf{2}}} = \boldsymbol{C}$

((E))B

((F))

((Q))2_SCOE// The solution of differential equation $\mathbf{sec^2}\,\boldsymbol{x}\,\mathbf{tan}\,\boldsymbol{y}\,\boldsymbol{dx} + \mathbf{sec^2}\,\boldsymbol{y}\,\mathbf{tan}\,\boldsymbol{x}\,\boldsymbol{dy} = \mathbf{0}$ is

((A))$\mathbf{sec^2}\,\mathbf{tan}\,\boldsymbol{y} = \boldsymbol{C}$

((B))$\tan x \sec^2 y = C$

((C))$\tan x \tan y = C$

((D))$\sec^2 x \sec^2 y = C$

((E))C

((F))

((Q))2_SCOE// The solution of differential equation $e^x \cos y\, dx + (1 + e^x) \sin y\ dy = 0$ is

((A))$(1 + e^x) = C sec\ y$

((B))$(1 + e^x) \sec y = C$

((C))$\frac{\sec y}{(1+e^x)}$=C

((D))$(1 + e^x) \cos y = C$

((E))B

((F))

((Q))2_SCOE// The solution of differential equation $y(1 + \log x) \frac{dx}{dy} - x \log x = 0 \ \ is$

((A))$\log(x \log x) = yC$

((B))$\frac{x}{logx} = yC$

((C))$y \log x = xC$

((D))$x \log x = yC$

((E))D

((F))

((Q))2_SCOE// The solution of differential equation $\frac{dy}{dx} + \sqrt{\frac{1-y^2}{1-x^2}} = 0$

((A))$\tan^{-1} x + \cot^{-1} y = C$

((B))$\sin^{-1} x + \sin^{-1} y = C$

((C))$\sec^{-1} x + cosec^{-1} x = C$

((D))$\sin^{-1} x - \sin^{-1} y = C$

((E))B

((F))

((Q))2_SCOE// If the integrating factor of differential equation $(x^2 + y^2 + 1)dx - 2xydy = 0$ is $\frac{1}{x^2}$ then its general solution is

((A))$x - y = c$

((B)) $\langle^{3} + 3y^2 = c$

((C))$x^2 - y^2 - 1 = cx$

((D))$x^2 + y^2 - 1 = cy$

((E))C

((F))

((Q))2_SCOE// If the integrating factor of differential equation $(2x\, log\, x - xy)dy + 2ydx = 0$ is $\frac{1}{x}$ then its general solution is

((A))$x^2 \log y - \frac{y}{3} = c$

((B))$2y \log x - \frac{y^2}{2} = c$

((C))$2x^2 \log x - xy^2 = c$

((D))$x \log y - x = c$

((E))B

((F))

((Q))2_SCOE// If the integrating factor of differential equation $(y^4 + 2y)dx + (xy^3 + 2y^4 - 4x.dy = 0$ is $\frac{1}{y^3}$ then its general solution is

((A))$\left(y + \frac{2}{y^2}\right)x + y^2 = c$

((B))$\left(1+\frac{1}{y^2}\right)x+y=c$

((C))$xy^4-2xy+x^2y^4=0$

((D))$y^3+2xy-2x^2=c$

((E))A

((F))

((Q))2_SCOE// If the integrating factor of differential equation $(x^7y^2+3y)dx+(3x^8y-x.dy=0$ is $\frac{y}{x^7}$ then its general solution is

((A))$x^3y+x^7y^4=c$

((B))$x^7y^3-x^2=cx^5$

((C))$xy^3-\frac{y^2}{2x^6}=c$

((D))$xy+\frac{y^2}{x^7}=c$

((E))C

((F))

((Q))2_SCOE// The value of λ for which the differential equation $(xy^2+\lambda x^2y)dx+(x^3+x^2y)dy=0$ is exact is

((A))-3

((B))2

((C))3

((D))1

((E))C

((F))

((Q))2_SCOE// The differential equation$(ay^2+x+x^8)dx+(y^8-y+bxy)dy=0$ is exact if

((A))$b\neq 2a$

((B))$b = a$

((C))$a = 1, b = 3$

((D))$b = 2a$

((E))D

((F))

((Q))2_SCOE// The differential equation$(3 + by \cos x)dx + (2 \sin x - 4y^3)dy = 0$ is exact if

((A))$b = -2$

((B))$b = 3$

((C))$b = 0$

((D))$b = 2$

((E))D

((F))

((Q))2_SCOE// Integrating factor of homogeneous D.E. $(xy - 2y^2)dx + (3xy - x^2)dy = 0$ is

((A))$\frac{1}{xy}$

((B))$\frac{1}{\square^2 y^2}$

((C))$\frac{1}{x^2 y}$

((D))$\frac{1}{\text{[illegible]}\, y^2}$

((E))D

((F))

((Q))2_SCOE// Integrating factor of differential equation $(1 + xy)ydx + (x^2y^2 + xy + 1)xdy = 0$ is

((A))$\frac{1}{x^2 y}$

((B))$-\frac{1}{x^3y^3}$

((C))$\frac{1}{xy^2}$

((D))$\frac{1}{x^2y^2}$

((E))B

((F))

((Q))2_SCOE// Integrating factor of differential equation $(x^2+y^2+x)dx+(xy)dy=0$ is

((A))$\frac{1}{x}$

((B))$\frac{1}{x^2}$

((C))x^2

((D))x

((E))D

((F))

((Q))2_SCOE// Integrating factor of differential equation $\left(y+\frac{y^3}{3}+\frac{x^2}{2}\right)dx+\left(\frac{x+xy^2}{4}\right)dy=0$ is

((A))x^2

((B))x^3

((C))$\frac{1}{x}$

((D))$\frac{1}{\square^3}$

((E))B

((F))

((Q))2_SCOE// Integrating factor of differential equation $(2x\log x-xy)dy+(2y)dx=0$ is

((A))$\frac{1}{x}$

((B))$\frac{1}{x^2y^2}$

((C))$\frac{1}{x^2}$

((D))$\frac{1}{y}$

((E))A

((F))

((Q))2_SCOE// Integrating factor of differential equation $(2xy^2 + ye^x)dx - e^x dy = 0$

((A))$\frac{1}{x}$

((B))$\frac{1}{y}$

((C))$\frac{1}{x^2}$

((D))$\frac{1}{y^2}$

((E))D

((F))

((Q))2_SCOE// Integrating factor of differential equation $(y^4 + 2y)dx + (xy^3 + 2y^4 - 4x)dy = 0$

((A))$\frac{2}{x}$

((B))$\frac{1}{y}$

((C))$\frac{1}{y^3}$

((D))$\frac{2}{y^2}$

((E))C

((F))

((Q))2_SCOE// Solution of non—exact differential equation $(x^2 - 3xy + 2y^2)dx + x(3x - 2y)dy = 0$ with integrating factor $\frac{1}{x^3}$ is

((A))$3\frac{y}{x} - \frac{y^2}{x^2} = C$

((B))$\log x - 3\frac{y}{x} + \frac{y^2}{x^2} = C$

((C))$\log x + 3\frac{y}{x} - 2\frac{y^2}{x^2} = C$

((D))$\log x + 3\frac{y}{x} - \frac{y^2}{x^2} = C$

((E))D

((F))

((Q))2_SCOE// Solution of non—exact differential equation $(3xy^2 - y^3)dx + (xy^2 - 2x^2y)dy = 0$ with integrating factor $\frac{1}{x^2y^2}$ is

((A))$3\log x - \frac{2y}{x^3} - 2\log y = C$

((B))$3\log x + \frac{y}{x} - 2\log y =$ 앞

((C))$3\log x + \frac{y}{x} = C$

((D))$\log x - \frac{y}{x} + 2\log y = C$

((E))B

((F))

((Q))2_SCOE// Solution of non—exact differential equation $(x^4e^x - 2mxy^2)dx + (2mx^2y)dy = 0$ with integrating factor $\frac{1}{x^4}$ is

((A))$e^x + \frac{6my^2}{x^4} = C$

((B))$e^x + \frac{2my^2}{x^2} = C$

((C))$e^x + \frac{y^2}{x^2} = C$

((D))$e^x + \frac{my^2}{x^2} = C$

((E))D

((F))

((Q))2_SCOE// The solution of D.E. is $\frac{dy}{dx} = e^{x-y} + 3x^2e^{-y}$

((A))$e^y = e^x + x^3 + C$

((B))$e^y = e^x + 3x^3 + C$

((C))$e^y = e^x + 3x + C$

((D))$e^x + e^y = 3x^3 + C$

((E))A

((F)))

((Q))2_SCOE// The solution of D.E. $x^3\left(x\frac{dy}{dx} + y\right) - sec(xy) = 0$ is

((A))$\tan(xy) + \frac{1}{2x^2} = C$

((B))$\sin(xy) + \frac{1}{2x^2} = C$

((C))$\sin(xy) - \frac{1}{2x^2} = C$

((D))$\sin(xy) - \frac{1}{4x^2} = C$

((E))B

((F)))

((Q))2_SCOE// The solution of D.E. $\sec^2 x \tan y \, dx + \sec^2 y \tan x \, dy = 0$ is

((A))$\sec^2 \tan y = C$

((B))$\tan x \sec^2 y = C$

((C))$\tan x \tan y = C$

((D))$\sec^2 x \sec^2 y = C$

((E))C

((F)))

((Q))2_SCOE//The solution of D.E. $e^x \cos y \, dx + (1 + e^x) \sin y \; dy = 0$ is

((A))$(1 + e^x) = Csec\ y$

((B))$(1 + e^x) \sec y = C$

((C))$\frac{\sec y}{(1+e^x)}$=C

((D))$(1 + e^x) \cos y = C$

((E))B

((F)))

((Q))2_SCOE// The solution of D.E. $y(1 + \log x) \frac{dx}{dy} - x \log x = 0 \quad is$

((A))$\log(x \log x) = yC$

((B))$\frac{x}{logx} = yC$

((C))$y \log x = xC$

((D))$x \log x = yC$

((E))D

((F)))

((Q39))2_SCOE// The general solution of the DE $e^y \frac{dy}{dx} + (e^y + 1) \cot x = 0$ is

((A))(e^y + 1) sec x = c

((B))(e^y + 1) sin x = c

((C))(e^y + 1) cosec x = c

((D))(e^y + 1) cos x = c

((E))b

((F))(e^y + 1) sin x = c

((Q))2_SCOE// The I.F for the linear differential equation

$$(1+x^2)\frac{dy}{dx}+2xy-4x^2=0 \text{ is}$$

((A))$2(1+x^2)$

((B))$(1+x^2)$

((C))$\log(1+x^2)$

((D))$e^{(1+x^2)}$

((E))B

((F)))

((Q))2_SCOE// The I.F for the linear differential equation $(x+2y^3)\frac{dy}{dx}=y$ is

((A))$\frac{1}{y^2}$

((B))$\frac{1}{y^3}$

((C))$\frac{1}{y}$

((D))$\frac{1}{y^4}$

((E))C

((F)))

((Q))2_SCOE// The I.F for the linear differential equation $\frac{dy}{dx}+\frac{y}{\sqrt{x}(1-x)}=1-\sqrt{x}$ is

((A))$\frac{1-\sqrt{x}}{1+\sqrt{x}}$

((B))$\frac{1+\sqrt{x}}{1-\sqrt{x}}$

((C))$e^{2\sqrt{x}}$

((D))$e^{-2\sqrt{x}}$

((E))B

((F)))

((Q))2_SCOE// The differential equation $\frac{dy}{dx}+p(x)y=Q(x)$ is

((A))Linear

((B))Bernoulli's

((C))Homogeneous

((D))None of these

((E))A

((F)))

((Q))2_SCOE// The integrating factor for the differential equation

$\frac{dy}{dx} + p(x)y = Q(x)$ is

((A))$e^{\int p\,dy}$

((B))$e^{\int p\,dx}$

((C))$e^{\int Qdx}$

((D))None of these

((E))B

((F)))

((Q))2_SCOE// The integrating factor for the differential equation

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

((A))$\frac{1}{1+y^2}$

((B))$e^{\tan^{-1} x}$

((C))$e^{\tan^{-1} y}$

((D))None of these

((E))C

((F)))

((Q))2_SCOE// In the linear differential equation $\frac{dx}{dy} + Px = Q$

((A))P & Q are functions of x

((B))P & Q functions of y

((C))P is a function of x & Q is function of y.

((D))P & Q are functions of x , y .

((E))B

((F)))

((Q))2_SCOE// The differential equation $\frac{dy}{dx} + P(x)y = Q(x)y^n$ is

((A))Linear equation

((B))Bernoulli's equation

((C))Non linear equation

((D))None of these

((E))B

((F)))

((Q))2_SCOE// The differential equation $f'(y)\frac{dy}{dx} + f(x)p(x) = Q(x)$ by putting

$f(y) = t$ can be reduced to

((A))$f(y)\frac{dt}{dx} + P(x)t = Q$

((B))$\frac{dt}{dx} + P(x)t = Q(x)$

((C))$\frac{dt}{dx} + t = Q(x)$

((D))None of these

((E))B

((F)))

((Q))2_SCOE// The integrating factor for the linear differential equation

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

((A))$e^{\sqrt{x}}$

((B))$\frac{1}{e^{\sqrt{x}}}$

((C))$e^{2\sqrt{x}}$

((D))$e^{-\sqrt{x}}$

((E))C

((F)))

((Q))2_SCOE// By putting $x^{1-n} = t$ the differential equation

$x^{-n}\,\frac{dx}{dy} + P\,x^{(1-n)} = Q$ can be reduced to the form

((A))$\frac{du}{dy} + (n-1)Pu = (1-n)Q$

((B))$\frac{du}{dy} + (n-1)Pu = (n-1)Q$

((C))$\frac{du}{dx} + (n-1)Pu = (1-n)Q$

((D))$\frac{du}{dx} + (1-n)Pu = (1-n)Q$

((E))D

((F)))

((Q))2_SCOE// The integrating factor of the non-exact differential equation $(y^4 + 2y)dx + (xy^3 + 2y^4 - 4x)dy = 0$ is

((A))y^3

((B))$1/x$

((C))$1/x^3$

((D))$1/y^3$

((E))D

((F))

((Q))2_SCOE// Integrating factor for the differential equation $\frac{dy}{dx} + \frac{4x}{x^2+1} y = \frac{1}{(x^2+1)^3}$ is

((A))x^2

((B))$1 + x^2$

((C))$(1 + x^2)^{-2}$

((D))$(1 + x^2)$

((E))D

((F))

((Q))2_SCOE// If the integrating factor of differential equation $\frac{dx}{dy} + \mathbf{x} \sec y = \frac{2y \cos y}{1+\sin y}$ is $\sec y + \tan y$ then its general solution is

((A))$(\sec y + \tan y)x = y^2 + c$

((B))$x^2 \sec y + \tan y = c$

((C))$\sec y + \tan y = xy + c$

((D))$\sec y + x^2 \tan y = x^2 + c$

((E))A

((F))

((Q))2_SCOE// The differential equation $(\mathbf{1+\sin y})\boldsymbol{dx} = (\mathbf{2y\cos y - x\sec y - x\tan y}.\boldsymbol{dy}$ is

((A))homogeneous

((B))variable separable

((C))Linear in $\boldsymbol{x}$

((D))none of these

((E))C

((F))

((Q))1_SCOE// The order and degree of the D.E $\left(1+\left(\frac{dy}{dx}\right)^3\right)^{\frac{3}{2}} = \frac{d^2y}{dx^2}$ is

((A))2,3

((B))2,2

((C))2,1

((D))3,2

((E))B

((F)))

((Q))1_SCOE// The order and degree of the D.E $\frac{d^3y}{dx^3} + \left(\frac{dy}{dx}\right)^2 + \int y\,dx = sin$x is

((A))4,1

((B))4,2

((C))2,2

((D))None of these

((E))A

((F)))

((Q))1_SCOE// The order and degree of the D.E $x + \left(\frac{dy}{dx}\right)^2 = A\sqrt{1+\left(\frac{dy}{dx}\right)^2}$ is

((A))2,2

((B))1,2

((C))1,3

((D))1,4

((E))D

((F)))

((Q))1_SCOE// The order and degree of the D.E $\frac{d^2y}{dx^2}+\left(\frac{dy}{dx}\right)^{10}=e^x sin(x)$

((A))1,10

((B))1,2

((C))1,3

((D))1,4

((E))D

((F)))

((Q))1_SCOE// The order and degree of the D.E $y_3(1+y_1^2)-3y_1y_2^2=0$ is

((A))3,1

((B))2,2

((C))3,2

((D))3,3

((E))A

((F)))

((Q))1_SCOE// The order and degree of the D.E $\frac{dy}{dx}+\frac{5k}{\left(\frac{dy}{dx}\right)^2}=6$ is

((A))2,1

((B))2,2

((C))2,3

((D))None of these

((E))D

((F)))

((Q))1_SCOE// The order and degree of the D.E

$\left(\frac{dr}{dt}\right)^4+\left(\frac{d^2r}{dt^2}\right)^3+\left(\frac{d^3r}{dt^3}\right)^2+\left(\frac{d^4r}{dt^4}\right)$=0

((A))1,4

((B))4,4

((C))4,1

((D))3,2

((E))C

((F)))

((Q))1_SCOE// The order and degree of the D.E $\frac{dy}{dx}=\frac{ax+by+c}{3x+2by+5}$ is

((A))1,0

((B))0,1

((C))1,1

((D))None of these

((E))C

((F)))

((Q))1_SCOE// The order of D.E whose general solution is $y = c_1 + c_2e^{-2x} + \quad c_3e^{3x} + c_4e^{-3x}$ where c_1, c_2, c_3, c_4 are arbitrary constants

((A))1

((B))3

((C))2

((D))4

((E))D

((F)))

((Q1))1_SCOE// The order and degree of differential equation $\frac{d^2y}{dx^2} + \left(\frac{dy}{dx}\right)^{10} = e^x \sin x$ is

((A))2,2

((B))2,10

((C))1,2

((D))2,1

((E))D

((F))

((Q2))1_SCOE// The general solution of n^{th} order ordinary differential equation must involve

((A))(n+1) arbitrary constants

((B))(n-1) arbitrary constant

((C))n arbitrary constants

((D))none of these

((E))c

((F))n arbitrary constants

((Q3))1_SCOE// The number of arbitrary constants in the general solution of ordinary differential equation is equal to

((A))The order of differential equation

((B))The degree of differential equation

((C))coefficient of highest order differential coeffic

((D))none of these

((E))a

((F))The order of differential equation

((Q16))1_SCOE//The order and degree of the differential equation $\frac{d^2y}{dx^2} = \left[y + \left(\frac{dy}{dx}\right)^2\right]^{1/4}$ are respectively

((A))4 and 2

((B))1 and 2

((C))1 and 4

((D))2 and 4

((E))d

((F))2 and 4

((Q30))1_SCOE// Degree of the DE $\left(\frac{d^3y}{dx^3}\right)^4 + \left(\frac{d^2y}{dx^2}\right)^5 = 0$ is

((A))3

((B))2

((C))4

((D))5

((E))c

((F))4

((Q))1_SCOE// The number of arbitrary constants in the general solution of ordinary differential equation is equal to

((A))The order of D.E

((B))The degree of D.E

((C))Coefficient of highest order differential coefficient

((D))None of these

((E))A

((F)))

((Q))1_SCOE// The general solution of $\boldsymbol{n^{th}}$order ordinary D.E must involve

((A))$(\boldsymbol{n+1})$ arbitrary constants

((B))$(\boldsymbol{n-1})$ arbitrary constants

((C))$\boldsymbol{n}$ arbitrary constants

((D))None of these

((E))C

((F)))

((Q))1_SCOE// The order of D.E whose general solution is

$$\boldsymbol{y = e^x(Ax^2 + Bx + C)}$$

where A,B,C are arbitrary constants is

((A))1

((B))2

((C))3

((D))4

((E))C

((F)))

((Q))1_SCOE// The D.E whose general solution is $\boldsymbol{y = \sqrt{5x + C}}$ where C is arbitrary constant, is

((A))$2y\frac{dy}{dx} - 1 = 0$

((B))$2y\frac{dy}{dx} - 5 = 0$

((C))$\frac{dy}{dx} - \frac{5}{2}\frac{1}{\sqrt{5x+C}} = 0$

((D))$y\frac{dy}{dx} - 5 = 0$

((E))B

((F)))

((Q))1_SCOE// The D.E whose general solution is $xy = C^2$, where C is arbitrary

constant, is

((A))$xy_1 - y = 0$

((B))$xy_2 + y_1 = 0$

((C))$xy_1 = C^2$

((D))$xy_1 + y = 0$

((E))D

((F)))

((Q5))1_SCOE// The differential equation whose general solution is y= A cos (x + 3), where A is arbitrary constant, is

((A))cot(x +3)y_1 + y =0

((B))tan(x +3)y_1 + y =0

((C))cot(x +3)y_1 - y =0

((D))tan(x +3)y_1 - y =0

((E))a

((F))cot(x +3)y_1 + y =0

((Q6))1_SCOE// y =mx where m is arbitrary constant is the general solution of the differential equation is

((A))$\frac{dy}{dx} = \frac{y}{x}$

((B))$\frac{dy}{dx} = \frac{x}{y}$

((C))$\frac{dy}{dx}$ =m

((D))$\frac{dy}{dx} = -\frac{y}{x}$

((E))a

((F))$\frac{dy}{dx} = \frac{y}{x}$

((Q29))1_SCOE// The family of curves y = Ax + x^2 of curves is represented by the DE of degree

((A))2

((B))3

((C))4

((D))1

((E))d

((F))1

((Q))1_SCOE// The order and degree of the differential equation $\left(1+\left(\frac{dy}{dx}\right)^3\right)^{\frac{3}{2}} = \frac{d^2y}{dx^2}$ is

((A))2,3

((B))2,2

((C))2,1

((D))3,2

((E))B

((F))

((Q))1_SCOE// The order and degree of the differential equation $\frac{d^3y}{dx^3} + \left(\frac{dy}{dx}\right)^2 + \int y\,dx = sib$x is

((A))4,1

((B))4,2

((C))2,2

((D))None of these

((E))A

((F))

((Q))1_SCOE// The order and degree of the differential equation $x + \left(\frac{dy}{dx}\right)^2 = A\sqrt{1+\left(\frac{dy}{dx}\right)^2}$ is

((A))2,2

((B))1,2

((C))1,3

((D))1,4

((E))D

((F))

((Q))1_SCOE// The order and degree of the differential equation $\frac{d^2y}{dx^2} + \left(\frac{dy}{dx}\right)^{10} = e^x sin(x)$

((A))1,10

((B))1,2

((C))1,3

((D))1,4

((E))D

((F))

((Q))1_SCOE// The order and degree of the differential equation $y_3(1 + y_1^2) - 3y_1y_2^2 = 0$ is

((A))3,1

((B))2,2

((C))3,2

((D))3,3

((E))A

((F))

((Q))1_SCOE// The order and degree of the differential equation $\frac{dy}{dx} + \frac{5k}{\left(\frac{dy}{dx}\right)^2} = 6$ is

((A))2,1

((B))2,2

((C))2,3

((D))None of these

((E))D

((F))

((Q))1_SCOE// The order and degree of the differential equation $\left(\frac{dr}{dt}\right)^4+\left(\frac{d^2r}{dt^2}\right)^3+\left(\frac{d^3r}{dt^3}\right)^2+\left(\frac{d^4r}{dt^4}\right)=0$

((A))1,4

((B))4,4

((C))4,1

((D))3,2

((E))C

((F))

((Q))1_SCOE// The order and degree of the differential equation $\frac{dy}{dx}=\frac{ax+by+c}{3x+2by+5}\ is$

((A))1,0

((B))0,1

((C))1,1

((D))None of these

((E))C

((F))

((Q))1_SCOE// The number of arbitrary constants in the general solution of ordinary differential equation is equal to

((A))The order of D.E

((B))The degree of D.E

((C))Coefficient of highest order differential coefficient

((D))None of these

((E))A

((F))

((Q))1_SCOE// The general solution of n^{th}order ordinary D.E must involve

((A))$(n+1)$ arbitrary constants

((B))$(n-1)$ arbitrary constants

((C))n arbitrary constants

((D))None of these

((E))C

((F))

((Q))1_SCOE// The order of D.E whose general solution is $y = c_1 + c_2e^{-2x} + c_3e^{3x} + c_4e^{-3x}$ where c_1, c_2, c_3, c_4 are arbitrary constants

((A))1

((B))3

((C))2

((D))4

((E))D

((F))

((Q))1_SCOE// The order of D.E whose general solution is $y = e^x(Ax^2 + Bx + C)$where A, B, C are arbitrary constants is

((A))1

((B))2

((C))3

((D))4

((E))C

((F))

((Q))1_SCOE// The values of $\boldsymbol{k}$ which make $\boldsymbol{y = ke^{kx}}$ a solution of $\boldsymbol{\frac{dy}{dx} - y = 0}$ are

((A))$\mathbf{1, 2}$

((B))$\mathbf{0, 1}$

((C))$\mathbf{0, -1}$

((D))$\pm\mathbf{1}$

((E))B

((F))

((Q))1_SCOE// The values of $\boldsymbol{k}$ which make $\boldsymbol{y} = \boldsymbol{ke^{kx}}$ a solution of $\mathbf{2}\frac{\boldsymbol{dy}}{\boldsymbol{dx}} - \mathbf{4}\boldsymbol{y} = \mathbf{0}$ are

((A))$\mathbf{0, 2}$

((B))$\pm\mathbf{1}$

((C))$\pm\mathbf{2}$

((D))$\mathbf{2, 4}$

((E))A

((F))

((Q))1_SCOE// The order of differential equation whose general solution is $\boldsymbol{y} = (\boldsymbol{c_1} + \boldsymbol{c_2})\,\mathbf{sin}(\mathbf{3}\boldsymbol{x} + \boldsymbol{c_3}. + \boldsymbol{c_4}\boldsymbol{e}^{\mathbf{4}\boldsymbol{x}+\boldsymbol{c_5}}$, where $\boldsymbol{c_1, c_2, c_3, c_4, c_5}$ are arbitrary constants, is

((A))5

((B))2

((C))4

((D))3

((E))D

((F))

((Q))1_SCOE// The order of differential equation whose general solution is $\boldsymbol{y} = \frac{\boldsymbol{c_1}}{\boldsymbol{c_2}}\mathbf{cos}(\mathbf{4}\boldsymbol{x} + \boldsymbol{c_3}. + \boldsymbol{c_4}\boldsymbol{e}^{\mathbf{2}\boldsymbol{x}-\boldsymbol{c_5}}$, where $\boldsymbol{c_1, c_2, c_3, c_4, c_5}$ are arbitrary constants, is

((A))2

((B))3

((C))4

((D))5

((E))B

((F))

((Q))1_SCOE// The order of differential equation whose general solution is $c_1 y = c_2 + c_3 x + c_3 x^2$, where c_1, c_2, c_3 are arbitrary constants, is

((A))1

((B))2

((C))3

((D))4

((E))B

((F))

((Q))1_SCOE// The order of differential equation whose general solution is $c_1 y e^{x+c_2} = c_3 e^{4x+c_4}$, where c_1, c_2, c_3, c_4 are arbitrary constants, is

((A))1

((B))2

((C))3

((D))4

((E))B

((F))

((Q))1_SCOE// The D.E. $\frac{dy}{dx} = e^{x-y} + 3x^2 e^{-y}$ is of the form

((A))Variable separable

((B))Homogeneous

((C))Linear

((D))Exact

((E))A

((F)))

((Q47))1_SCOE// The order of the DE of which xy = $ce^{x} + be^{-x} + x^{2}$ is a solution is

((A))1

((B))3

((C))2

((D))None of these

((E))c

((F))2

((Q))1_SCOE// For solving the D.E. $(x + y + 1)dx + (2x + 2y + 4)dy = 0$ appropriate substitution is

((A))$x + y = 1$

((B))$x + y = u$

((C))$x - y = u$

((D))None of these

((E))B

((F)))

((Q))1_SCOE// The D.E. $\frac{dy}{dx} = \frac{x^3-3xy^2}{y^3-3x^2y}$ is of the form

((A))Variable separable

((B))Homogeneous

((C))Linear

((D))Exact

((E))B

((F)))

((Q))1_SCOE// The D.E. $\frac{dy}{dx} = \frac{x+2y-3}{3x+6y-1}$ is of the form

((A))Variable separable

((B))Homogeneous

((C))Non-homogeneous

((D))Exact

((E))C

((F)))

((Q))1_SCOE// The necessary and sufficient condition that the D.E $\mathrm{M(x, y)\ dx\ +\ N(x, y)\ dy\ =\ 0}$ be exact is

((A))$\frac{\partial M}{\partial y} = \frac{\partial N}{\partial x}$

((B))$\frac{\partial M}{\partial x} = \frac{\partial N}{\partial y}$

((C))$\frac{\partial M}{\partial y} \neq \frac{\partial N}{\partial x}$

((D))$\frac{\partial M}{\partial x} - \frac{\partial N}{\partial y} = 1$

((E))A

((F)))

((Q))1_SCOE// If homogeneous D.E. $\mathrm{M(x, y)\ dx\ +\ N(x, y)\ dy\ =\ 0}$is not exact then the integrating factor is

((A))$\frac{1}{My+Nx}$; $My + Nx \neq 0$

((B))$\frac{1}{Mx-Ny}$; $Mx - Ny \neq 0$

((C))$\frac{1}{Mx+Ny}$; $Mx + Ny \neq 0$

((D))$\frac{1}{My-Nx}$; $My - Nx \neq 0$

((E))C

((F)))

((Q))1_SCOE// If the D.E. $\mathrm{M(x, y)\ dx\ +\ N(x, y)\ dy\ =\ 0}$ is not exact and it can be written as $yf_1(xy)dx + xf_2(xy)dy = 0$ then the I.F. is

((A))$\frac{1}{My+Nx}$; $My + Nx \neq 0$

((B))$\frac{1}{Mx-Ny}$; $Mx - Ny \neq 0$

((C))$\frac{1}{Mx+Ny}$; $Mx + Ny \neq 0$

((D))$\frac{1}{My-Nx}$; $My - Nx \neq 0$

((E))B

((F)))

((Q))1_SCOE//44 If the D.E. $\mathrm{M}(\mathrm{x}, \mathrm{y})\ \mathrm{dx} + \mathrm{N}(\mathrm{x}, \mathrm{y})\ \mathrm{dy} = 0$is not exact and $\frac{\frac{\partial M}{\partial y}-\frac{\partial N}{\partial x}}{M} = f(x)$ then th I.F. is

((A))$e^{f(x)}$

((B))$e^{\int f(x)dy}$

((C))$f(x)$

((D))$e^{\int f(x)dx}$

((E))D

((F)))

((Q))1_SCOE//45 If the D.E. $\mathrm{M}(\mathrm{x}, \mathrm{y})\ \mathrm{dx} + \mathrm{N}(\mathrm{x}, \mathrm{y})\ \mathrm{dy} = 0$is not exact and $\frac{\frac{\partial N}{\partial x}-\frac{\partial M}{\partial y}}{M} = f(y)$ then th I.F. is

((A))$e^{f(y)}$

((B))$e^{\int f(y)dx}$

((C))$f(y)$

((D))$e^{\int f(y)dy}$

((E))D

((F)))

((Q))1_SCOE// The total derivative of $x\ dy + y\ dx$ is

((A))$d\left(\frac{y}{x}\right)$

((B))$d\left(\frac{x}{y}\right)$

((C))$d(xy)$

((D))$d(x+y)$

((E))C

((F)))

((Q))1_SCOE// The total derivative of $x\ dy - y\ dx$ is with I.F. $\frac{1}{x^2}$

((A))$d\left(\frac{y}{x}\right)$

((B))$d\left(\frac{x}{y}\right)$

((C))$d(\log\frac{x}{y})$

((D))$d(x-y)$

((E))A

((F)))

((Q))1_SCOE// The D.E. $(x+y-2)dx+(x-y+4)dy=0$ is of the form

((A))Exact

((B))Homogeneous

((C))Linear

((D))None of these

((E))A

((F)))

((Q19))1_SCOE// The differential equation $e^x \frac{dy}{dx} + 3y = x^2 y$ is

((A))Separable and non–linear

((B))Linear and not separable

((C))Both separable and linear

((D))Neither separable and nor linear

((E))c

((F))Both separable and linear

((Q20))1_SCOE// Which of the following is a DE

((A))$\left(\frac{dy}{dx}\right)^2 + \frac{d^2y}{dx^2} = x + 2y$

((B))$x^2 + y^2 + z^2 = 1$

((C))$\sin x + \cos y = \tan z$

((D))$3x^3 + 2x^2 + x + 1 = 0$

((E))a

((F))$\left(\frac{dy}{dx}\right)^2 + \frac{d^2y}{dx^2} = x + 2y$

((Q22))1_SCOE// Which of the following is a third order DE

((A))$\left(\frac{d^3y}{dx^3}\right)^2 + \left(\frac{d^5y}{dx^5}\right)^4 = 0$

((B))$\left(\frac{d^4y}{dx^4}\right)^2 + \left(\frac{dy}{dx}\right)^3 = 0$

((C))$\left(\frac{d^2y}{dx^2}\right)^3 + \left(\frac{dy}{dx}\right)^4 = 0$

((D))$\left(\frac{d^3y}{dx^3}\right)^2 + \left(\frac{d^2y}{dx^2}\right)^2 = 0$

((E))d

((F))$\left(\frac{d^3y}{dx^3}\right)^2 + \left(\frac{d^2y}{dx^2}\right)^2 = 0$

((Q32))1_SCOE// For solving $\frac{dy}{dx} = 4x + y + 1$, the suitable substitution is

((A))$y = vx$

((B))$x = vy$

((C))$y + 4x + 1 = v$

((D))$y = 4x + v$

((E))c

((F))$y + 4x + 1 = v$

((Q33))1_SCOE// The homogeneous DE M (x, y) dx + N (x, y) dy = 0 can be reduced to a DE in which variables are separated by the substitution.

((A))y = vx

((B))xy = v

((C))x + y = v

((D))x – y = v

((E))a

((F))y = vx

((Q34))1_SCOE// The graphs of the solution of the DE $\frac{dy}{dx} = -\frac{x}{y}$ are

((A))Straight lines

((B))Parabolas

((C))Hyperbolas

((D))Circles

((E))d

((F))Circles

((Q40))1_SCOE// The DE $(x^3 - 3xy^2)\,dx + (y^3 - 2x^2y)\,dy = 0$ is

((A))Exact

((B))Homogeneous

((C))Variable separable

((D))Bernoulli's DE

((E))b

((F))Homogeneous

((Q50))1_SCOE// The DE that can be expressed in the form M (x) dx + N (y) dy = 0 is classified as a

((A))Homogeneous

((B))Separable

((C))Exact

((D))Linear

((E))b

((F))Separable

((Q))1_SCOE// The differential equation $(x^3 + 3y^2x)dx + (y^3 + 3x^2y)dy = 0$ is

((A))Only homogeneous

((B))Exact and homogeneous

((C))Only exact

((D))None of these

((E))B

((F))

((Q))1_SCOE// The differential equation $\frac{dy}{dx} = \frac{2x-y}{x-y}$ is

((A))Only exact

((B))Exact and homogeneous

((C))Only homogeneous

((D))None of these

((E))C

((F))

((Q))1_SCOE// The integrating factor for the linear differential equation $\frac{dy}{dx}+\frac{y}{\sqrt{x}}=\frac{e^{-2\sqrt{x}}}{\sqrt{x}}$ is

((A))$e^{\sqrt{x}}$

((B))$e^{\frac{1}{\sqrt{x}}}$

((C))$e^{2\sqrt{x}}$

((D))$e^{-\sqrt{x}}$

((E))C

((F))

((Q))1_SCOE// The differential equation $\frac{dy}{dx}+P(x)y=Q(x)y^n$ is

((A))Linear equation

((B))Non-linear equation

((C))Bernoulli's equation

((D))None of these

((E))C

((F))

((Q))1_SCOE// The integrating factor for differential equation $(1+y^2)\frac{dx}{dy}+x=e^{-\tan^{-1}y}$ is

((A))$\frac{1}{1+y^2}$

((B))$e^{\tan^{-1}x}$

((C))$e^{\tan^{-1} y}$

((D))None of these

((E))C

((F))

((Q))1_SCOE// The differential equation $\frac{dy}{dx} = \frac{3x+2y}{x+3}$ is

((A))exact

((B))linear

((C))non homogeneous

((D))homogeneous

((E))C

((F))

((Q))1_SCOE// The differential equation $x\frac{dy}{dx} + \frac{y^2}{x} = y$ is

((A))homogeneous

((B))exact

((C))non- homogeneous

((D))none of these

((E))A

((F))

((Q))1_SCOE// For what values of a and b, the differential equation $(y + x^3)dx + (ax + by^3)dy = 0$ is exact.

((A))$b = 1,$ for all values of b

((B))$a = 2, b = 1$

((C))$a = 1,$ for all values of b

((D))$a = -1, b = 3$

((E))C

((F))

((Q))1_SCOE// For what values of a, the differential equation $(ye^{xy} + ay^3)dx + (xe^{xy} + 12xy^2 - 2y)dy = 0$ is exact.

((A))$a = 2$

((B))$a = 4$

((C))$a = 3$

((D))$a = 1$

((E))B

((F))

((Q))1_SCOE// The differential equation $\frac{\boldsymbol{dy}}{\boldsymbol{dx}} = \boldsymbol{e^{x-y} + 3x^2e^{-y}}$ is of the form

((A))Variable separable

((B))Homogeneous

((C))Linear

((D))Exact

((E))A

((F))

((Q))1_SCOE// For solving the differential equation $\boldsymbol{(x + y + 1)dx + (2x + 2y + 4)dy = 0}$ appropriate substitution is

((A))$\boldsymbol{x + y = 1}$

((B))$\boldsymbol{x + y = u}$

((C))$\boldsymbol{x - y = u}$

((D))None of these

((E))B

((F))

((Q))1_SCOE// The differential equation $\frac{dy}{dx} = \frac{x^3-3xy^2}{y^3-3x^2y}$ is of the form

((A))Variable separable

((B))Homogeneous

((C))Linear

((D))Exact

((E))B

((F))

((Q))1_SCOE// The differential equation $\frac{dy}{dx} = \frac{x+2y-3}{3x+6y-1}$ is of the form

((A))Variable separable

((B))Homogeneous

((C))Non-homogeneous

((D))Exact

((E))C

((F))

((Q))1_SCOE// The solution of differential equation is $\frac{dy}{dx} = e^{x-y} + 3x^2e^{-y}$

((A))$\boldsymbol{e^y = e^x + x^3 + C}$

((B))$\boldsymbol{e^y = e^x + 3x^{3t} + C}$

((C))$\boldsymbol{e^y = e^x + 3x + C}$

((D))$\boldsymbol{e^x + e^y = 3x^3 + C}$

((E))A

((F))

((Q))1_SCOE// The necessary and sufficient condition that the differential equation $M(x, y. dx\ +\ N(x, y. dy\ =\ 0$ be exact is

((A))$\boldsymbol{\frac{\partial M}{\partial y} = \frac{\partial N}{\partial x}; My + Nx \neq 0}$

((B))$\boldsymbol{\frac{\partial M}{\partial x} = \frac{\partial N}{\partial y}; My + Nx \neq 0}$

((C))$\boldsymbol{\frac{\partial M}{\partial y} \neq \frac{\partial N}{\partial x}; My + Nx \neq 0}$

((D))$\boldsymbol{\frac{\partial M}{\partial x} - \frac{\partial N}{\partial y} = 1; My + Nx \neq 0}$

((E))A

((F))

((Q))1_SCOE// If homogeneous differential equation $\mathrm{M(x, y. dx\ +\ N(x, y. dy\ =\ 0}$ is not exact then the integrating factor is

((A))$\frac{1}{My+Nx}; M \langle + Nx \neq 0$

((B))$\frac{1}{Mx-Ny}; Mx - Ny \neq 0$

((C))$\frac{1}{Mx+Ny}; Mx + Ny \neq 0$

((D))$\frac{1}{My-Nx}; My - Nx \neq 0$

((E))C

((F))

((Q))1_SCOE// If the differential equation $\mathrm{M(x, y. dx\ +\ N(x, y. dy\ =\ 0}$ is not exact and it can be written as $yf_1(xy)dx + xf_2(xy)dy = 0$ then the I.F. is

((A))$\frac{1}{My+Nx}$; $My + Nx \neq 0$

((B))$\frac{1}{Mx-Ny}$; $Mx - Ny \neq 0$

((C))$\frac{1}{Mx+Ny}$; $Mx + Ny \neq 0$

((D))$\frac{1}{My-Nx}$; $My - Nx \neq 0$

((E))B

((F))

((Q))1_SCOE// If the differential equation $\mathrm{M(x, y. dx\ +\ N(x, y. dy\ =\ 0}$is not exact and $\frac{\frac{\partial M}{\partial y}-\frac{\partial N}{\partial x}}{M} = f(x)$. then the integrating factor is

((A))$e^{f(x)}$

((B))$e^{\int f(x)dy}$

((C))$f(x)$

((D))$e^{\int f(x)dx}$

((E))D

((F))

((Q))1_SCOE// If the differential equation $\mathrm{M(x, y. dx\ +\ N(x, y. dy\ =\ 0}$is not exact and $\frac{\frac{\partial N}{\partial x}-\frac{\partial M}{\partial y}}{M} = f(y$. then the integrating factor is

((A))$e^{f(y)}$

((B))$e^{\int f(y)dx}$

((C))$f(y.$

((D))$e^{\int f(y)dy}$

((E))D

((F))

((Q))1_SCOE// The total derivative of $x\,dy + y\,dx$ is

((A))$d\left(\frac{y}{x}\right)$

((B))$d\left(\frac{x}{y}\right)$

((C))$d(xy.$

((D))$d(x + y.$

((E))C

((F))

((Q))1_SCOE// The total derivative of $x\,dy - y\,dx$ is with integrating factor $\frac{1}{x^2}$

((A))$d\left(\frac{y}{x}\right)$

((B))$d\left(\frac{x}{y}\right)$

((C))$d(\log\frac{x}{y}.$

((D))$d(x - y.$

((E))A

((F))

((Q))1_SCOE// The differential equation $(x + y - 2)dx + (x - y + 4)dy = 0$ is of the form

((A))Exact

((B))Homogeneous

((C))Linear

((D))None of these

((E))A

((F))

)2_SCOE//The orthogonal trajectories of the series of hyperbolas $xy = c^2$ is

)$x^2 + y^2 = c^2$

)$x^2y^2 = c^2$

)$y^2 - x^2 = c^2$

)None of these

)C

)$y^2 - x^2 = c^2$

))2_SCOE//The orthogonal trajectories of the family of curves $r\cos\theta = a$ is

))$r\sin\theta = c$

))$r\tan\theta = c$

))$\frac{r}{\sin\theta} = c$

))None of these

))A

))$r\sin\theta = c$

)2_SCOE//The orthogonal trajectory of $y = ax^2$ is

)$x^2 + y^2 = c^2$

)$x^2 + (y^2/2) = c^2$

)$(x^2/2) + y^2 = c$

)None of these

)C

)$(x^2/2) + y^2 = c$

)2_SCOE//The orthogonal trajectory of parabola is

)circle

)hyperbola

)ellipse

)straight line

)C

)ellipse

)2_SCOE//The orthogonal trajectory of the family of circles with centre at (0,0) is a family of

)circle

)straight lines through (0,0)

)any straight line

)parabola

)B

)straight lines through (0,0)

))2_SCOE//The orthogonal trajectories for the family $r = a\theta$ is

))$r = ce^{-\frac{\theta^2}{2}}$

))$r = c\ e^{-\frac{\theta}{2}}$

))$r^2 = c_1 e^{-\frac{\theta^2}{2}}$

))None of these

))A

))

))2_SCOE//The orthogonal trajectories for the family of curves $r = \left(\frac{2a}{1+cos\theta}\right)$ is

))$r = \left(\frac{2c}{1-cos\theta}\right)$

))$r = \left(\frac{2c}{1+sin\theta}\right)$

)) $r = \left(\frac{2c}{1-sin\theta}\right)$

))None of these

))A

))

))2_SCOE//The orthogonal trajectories for the family of curves

$= a(1 + cos\theta)$ is

))$r = c(1 - sin\theta)$

))$r = c(1 + sin\theta)$

))$r = c\ (1 - cos\theta)$

))None of these

))C

))

))2_SCOE//The orthogonal trajectories for the family of curves $xy = c^2$ is

))$x^2 + y^2 = a^2$

))$y^2 = ax$

))$x^2 - y^2 = a^2$

))None of these

))C

))

))2_SCOE//The orthogonal trajectories for the family $y = mx$ is

))$x^2 - y^2 = a^2$

))$x^2 + y^2 = a^2$

))$xy = a^2$

))None of these

)B

))

))2_SCOE//The orthogonal trajectory of $y = ax^2$ is

))$x^2 + y^2 = c^2$

))$x^2 + (y^2/2) = c^2$

))$(x^2/2) + y^2 = c$

))None of these

))C

))

))2_SCOE//The orthogonal trajectory of parabola is

))Circle

))Hyperbola

))Ellipse

))Straight line

))C

))

))2_SCOE//The orthogonal trajectory of the family of circles with centre at (0,0) is a family of

))Circles

))Straight lines through (0,0.

))any straight line

))Parabola

))B

))

))2_SCOE//The differential equation for the orthogonal trajectory of the family of curves $x^2 +$ $^2 = c^2$ is

A)) $x + 2y\frac{dy}{dx} = 0$

B)) $2\frac{dx}{x} = \frac{dy}{y}$

C)) $xdx + ydy = 0$

D)) $\frac{dx}{x} = \frac{dy}{y}$

E))B

F))

Q))2_SCOE//The differential equation of orthogonal trajectory of the family of curves $r^2 = a\sin 2\theta$

A)) $\frac{dr}{r} = -\tan 2\theta\, d\theta$

B)) $\frac{dr}{r} = \tan 2\theta\, d\theta$

C)) $dr = \tan 2\theta\, d\theta$

D))None of these

E)) A

F))

Q))2_SCOE//The differential equation of orthogonal trajectory of the family of curves $r^2 =$
$\cos 2\theta$ is

A)) $r\frac{d\theta}{dr} = \tan 2\theta$

B)) $rdr = \tan 2\theta\, d\theta$

C)) $rdr = \cot 2\theta\, d\theta$

D)) $rdr + \tan\theta\, d\theta = 0$

E))A

F))

Q))2_SCOE//If The differential equation of orthogonal trajectory of a curve is $r\frac{d\theta}{dr} + \cot(\theta/2) = 0$
en its orthogonal trajectory is

A)) $r = \cos\theta$

))$r = c(1 - \sin\theta)$

))$r = c(1 - \cos\theta)$

))$r = b(1 + \cos\theta)$

))D

))

))2_SCOE//The orthogonal trajectories of the series of hyperbolas $xy = c^2$ is

))$x^2 + y^2 = c^2$

))$x^2y^2 = c^2$

))$y^2 - x^2 = c^2$

))None of these

))C

))

))2_SCOE//The differential equation of orthogonal trajectories of family of straight lines $y = mx$

))$x\,dx - y\,dy = 0$

))$ydx - xdy = 0$

))$x\,dx + ydy = 0$

))$ydx + xdy = 0$

))C

))

))2_SCOE//The orthogonal trajectories of the family of curves $r\cos\theta = a$ is

))$r\sin\theta = c$

))$r\tan\theta = c$

))$\frac{r}{\sin\theta} = c$

))None of these

)) A

))

)2_SCOE//An ice ball melts. The rate at which it melts is proportional to the amount of the ice at t time. If half of the quantity of ice melts in 20 minutes then after one hour the amount of ice left be

)1/8th of the original

)1/4th of the original

)1/3rd of the original

)Nothing will be left

)A

)1/8th of the original

)2_SCOE//A ball at temperature of 32^0C is kept in a room where the temperature is 10^0C. If the cools to 27^0C in hour then its temperature is given by

)$T = 22\ e^{0.205\ t}$

))$T = 10\ e^{1.163t}$

))$T = 10 + 22e^{-0.258t}$

))$T = 32 - 10e^{-0.093t}$

))C

))$T = 10 + 22e^{-0.258t}$

)2_SCOE//In certain data of newton's law of cooling, $-kt = \log\left(\frac{\theta-40}{60}\right)$ and at $t = 4, \theta = 60^0$, then value of k is

)$\log(1/3)$

)$-\log(1/3)$

)$4\log(1/3)$

)$(1/4)\log 3$

)D

)$(1/4)\log 3$

)2_SCOE//If the temperature of water initially is 100^0C and $\theta_0 = 20^0C$, and water cools down to C in first 20 minutes with $k = \frac{1}{20}\log 2$, then during what time will it cool to 30^0C

)60 min

)50 min

)1.5 hour

)40 min

)A

)60 min

)2_SCOE//If a body originally at 80^0C, with $\theta_0 = 40^0C$ and $k = \frac{1}{20}\log 2$, then the temperature of y after 40 min is

)40^0C

)50^0C

)80^0C

)30^0C

)B

)50^0C

)2_SCOE//If the body at 100^0C is placed in room whose temperature is 10^0C and cools to 60^0C in inutes then the value of k is

)$\log 2$

)$-\log 2$

)$(1/5)\log 2$

)$5\log 2$

)C

)$(1/5)\log 2$

)2_SCOE//The integrating factor for the DE of R-L series circuit with emf E is

)$e^{\int R dt}$

)e^{Rt+c}

)$e^{\int \frac{R}{L}\,dt}$

)$e^{\int idt}$

)C

)$e^{\int \frac{R}{L}\,dt}$

))2_SCOE//The integrating factor for the DE of R-C series circuit with emf E is

)$e^{\int RCdt}$

)$e^{\int \frac{1}{RC}dt}$

)$e^{\int \frac{1}{R}\,dt}$

)$e^{\int \frac{1}{C}\,dt}$

)B

)$e^{\int \frac{1}{RC}dt}$

)2_SCOE//If L = 640 H , R = 250 Ω & E = 500 volts and $i = \frac{E}{R}\left(1 - e^{-\frac{R}{L}t}\right)$ then i_{max} as $t \to \infty$ is

)-2

) $\frac{E}{L}$

)2

))0

)C

)

)2_SCOE//The I.F for the differential equation $L\frac{di}{dt} + Ri = E$ is

)$e^{-\frac{R}{L}t}$

)$e^{-\frac{E}{L}t}$

)$e^{\frac{t}{RL}}$

)$e^{\frac{R}{L}t}$

)D

)

)2_SCOE//The current $i = \frac{E}{R}\left(1 - e^{-\frac{R}{L}t}\right)$ Builds up to half of it's theoretical maximum value in
e (in seconds)

)$\frac{R}{L}$ log2

)$\frac{L}{R}\log 2$

)$-\frac{R}{L}\log 2$

)$-\frac{L}{R}\log 2$

)B

)

)2_SCOE//The I.F for the linear differential equation $R\frac{dq}{dt} + \frac{q}{C} = E$ is

)$e^{\frac{t}{RC}}$

)$e^{-\frac{t}{RC}}$

)$e^{\frac{E}{R}t}$

)None of these

)A

)

)2_SCOE//The I.F for the linear differential equation $Ri + \frac{q}{C} = E$ is

)$e^{\frac{q}{Ct}}$

)$e^{\frac{t}{RC}}$

)$e^{\frac{R}{C}t}$

)$e^{\frac{E}{R}t}$

)B

)

)2_SCOE//If $i=\frac{E}{R}+k\,e^{-\frac{R}{L}t}$ is instantaneous current then i_{max} as

∞ is ,

)$\frac{R}{L}$

)$-\frac{R}{L}$

)$\frac{E}{R}$

)$-\frac{E}{R}$

)C

)

)2_SCOE//In certain data of Newton's law of cooling, $-kt=\log\left(\frac{\theta-40}{60}\right)$ and at $t=4, \theta=60^0$, then value of k is

)$\log(1/3.$

)$-\log(1/3.$

)$4\log(1/3.$

)$(1/4)\log 3$

) D

)

)2_SCOE//If the temperature of water initially is 100^0C and $\theta_0=20^0C$, and water cools down to C in first 20 minutes with $k=\frac{1}{20}\log 2$, then during what time will it cool to 30^0C

)60 min

)50 min

)1.5 hour

)40 min

)A

)

)2_SCOE//If a body originally at 80^0C, with $\theta_0 = 40^0C$ and $k = \frac{1}{20}\log 2$, then the temperature of
y after 40 min is

)40^0C

)50^0C

)80^0C

)30^0C

)B

)

)2_SCOE//If the body at 100^0C is placed in room whose temperature is 10^0C and cools to 60^0C in
inutes then the value of k is

)$\log 2$

)$-\log 2$

)$(1/5)\log 2$ s

)$5\log 2$

)C

)

)2_SCOE//The integrating factor for The differential equation of R-L series circuit with emf E is

)$e^{\int Rdt}$

)e^{Rt+c}

)$e^{\int \frac{R}{L}dt}$

)$e^{\int i dt}$

)C

)

)2_SCOE//If $i = \frac{E}{R} + ke^{-\frac{Rt}{L}}$ then the maximum value of i is

)R/L

)E/R

)−E/R

)2R/L

)B

)

)2_SCOE//The integrating factor for The differential equation of R-C series circuit with emf E is

)$e^{\int RC dt}$

)$e^{\int \frac{1}{RC} dt}$

)$e^{\int \frac{1}{R} dt}$

)$e^{\int \frac{1}{C} dt}$

)B

)

)2_SCOE//If $i = \frac{E}{R}\left(1 - e^{-\frac{Rt}{L}}\right)$ then the 50% of maximum current is

)E/R

)E/2R

)2E/R

)2R/E

)B

)

)2_SCOE//If 10 grams of some radioactive substance reduces to 8 gm in 60 years, in how many rs will 2 gm of it will be left ?

)120 yrs

)378 yrs

)220 yrs

)433 yrs

)D

)

)2_SCOE//A ball at temperature of 32^0C is kept in a room where the temperature is 10^0C. If the l cools to 27^0C in hour then its temperature is given by

)$T = 22\ e^{0.205\ t}$

)$T = 10\ e^{1.163t}$

)$T = 10 + 22e^{-0.258t}$

)$T = 32 - 10e^{-0.093t}$

)C

)

)2_SCOE//Let the population of country be decreasing at the rate proportional to its population. he population has decreased to 25% in 10 years, how long will it take to half.

))20 years

))8.3 years

))15 years

))5 years

))B

))8.3 years

)2_SCOE//If 10 grams of some radioactive substance reduces to 8 gm in 60 years, in how many rs will 2 gm of it will be left ?

))120 yrs

))378 yrs

) 220 yrs

))433 yrs

))D

))433 yrs

))2_SCOE//A body of mass m falls from rest under gravity in a fluid whose resistance to motion mkv where k is constant .The D.E. of motion is $\frac{dv}{dt}$=g-kv ,then the terminal velocity is

((A)) $\frac{k}{g}$

((B)) $\frac{g}{k}$

((C)) $\frac{-g}{k}$

((D))none of these.

((E))B

((F)) $\frac{g}{k}$

Q))2_SCOE//A vehicle starts from rest and its acceleration is given by $\frac{dv}{dt}$=k(1-$\frac{t}{T}$) where k and T re constants .Then the velocity v in terms of tome t is given by

((A))v=k(t-$\frac{t^2}{T}$)

((B))v=k(t-$\frac{t^2}{2}$)

((C))v=k($\frac{t^2}{2}-\frac{t^3}{3T}$)

((D))v=k(t-$\frac{t^2}{2T}$)

((E))D

((F))v=k(t-$\frac{t^2}{2T}$)

((Q))2_SCOE//The D.E. for steady state heat loss per unit time from a spherical shell with thermal conductivity k radius r_0 carrying steam at temperature T_0, if the spherical shell is covered with insulation of thickness w ,the outer surface of which remains at the constant temperature T_1 is

((A))Q = -K(2πr)$\frac{dT}{dr}$

((B))Q = K(2πr)$\frac{dT}{dr}$

((C)) Q = -K(4π r^2) $\frac{dT}{dr}$

((D)) Q = -K(π r^2) $\frac{dT}{dr}$

((E))C

((F)) Q = -K(4π r^2) $\frac{dT}{dr}$

((Q))2_SCOE// The motion of a particle moving along a straight line is

$\frac{d^2x}{dt^2} + 16x = 0$ then it's period is

((A))$\frac{2\pi}{\sqrt{2}}$

((B))$\frac{\pi}{2}$

((C))2π

((D))π

((E))B

((F))

((Q))2_SCOE//In S.H.M $V^2 = -3x^2 + 112$, the distance at which the particle attains it's maximum acceleration is

((A))$\frac{\sqrt{112}}{3}$

((B))$\sqrt{\frac{112}{\sqrt{3}}}$

((C))$\frac{\sqrt{112}}{\sqrt{3}}$

((D))112

((E))C

((F))

((Q))2_SCOE//In S.H.M $v^2 = -3x^2 + 112$ then it's greatest acceleration is

((A))$\sqrt{336}$

((B))$\sqrt{333}$

((C))$\sqrt{330}$

((D))$\sqrt{636}$

((E))A

((F))

((Q))2_SCOE//If the equation of S.H.M is $\frac{d^2x}{dt^2} = -kx$ then frequency of S.H.M is

((A))$\frac{2\pi}{\sqrt{k}}$

((B))$\frac{\sqrt{k}}{2\pi}$

((C))$\frac{2\pi}{k}$

((D))$\frac{k}{2\pi}$

((E))B

((F))

((Q))2_SCOE//If the equation of S.H.M is $m\frac{d^2x}{dt^2} = -mn^2x$ then $v^2$is equal to ,

((A))$-n^2x^2 + A$

((B))$n^2x^2 + A$

((C))$nx + A$

((D))$-n^2x + A$

((E))A

((F))

((Q))2_SCOE//If a body opposed by force per unit mass of value cx and resistance per unit mass of value kv^2 then the equation of motion is

((A))$a = cx - bv^2$

((B))$a = bv^2 - cx$

((C))$v\frac{dv}{dx} = -cx - bv^2$

((D))$v\frac{dv}{dx} = cx + bv^2$

((E))C

((F))

((Q))2_SCOE//If $\frac{d^2x}{dt^2} = -\omega^2x$ is differential equation of SHM then period T is

((A))$2\pi/\omega$

((B))$2\pi/\sqrt{\omega}$

((C))π/ω

((D))$-2\pi/\omega$

((E))A

((F))

((Q))2_SCOE//The D.E. for steady state heat loss Q per unit time from a unit length of pipe with thermal conductivity k , radius r_0 carrying steam at temperature T_0 , if the pipe is covered with insulation of thickness W ,the outer surface of which remains constant temperature T_1 ,is $Q=-k(2\pi r)\frac{dT}{dr.}$ Then the temperature T of surface of pipe of radius r is

((A))$T=\frac{Q}{2\pi k}\frac{1}{r}+C$

((B))$T=\frac{Q}{2\pi k}\log r+C$

((C))$T=-\frac{Q}{2\pi k}\frac{1}{r}+C$

((D))$T=-\frac{Q}{2\pi k}\log r+C$

((E))D

((F))$T=-\frac{Q}{2\pi k}\log r+C$

((Q))2_SCOE//A q be the quantity of heat that across an area A cm^2 and thickness δx in one second where the difference of temperature at the faces is δT , then by Fourier law of heat conduction

((A))q=$-k\left(A-\frac{dT}{dx}\right)$, where k is thermal conductivity

((B))$q=kA\frac{dT}{dx}$, where k is thermal conductivity

((C))q=$-k\left(A+\frac{dT}{dx}\right)$, where k is thermal conductivity

((D)) $q=-kA\frac{dT}{dx}$, where k is thermal conductivity.

((E))D

((F)) $q=-kA\frac{dT}{dx}$, where k is thermal conductivity.

((Q))2_SCOE//A pipe 10 cm in diameter contains steam at 100^0 C .It is protected with asbestos 5 cm thick for which k=0.0006 and outer surface is at 30^0 C. The D.E. of conduction of heat is Dt= $-\frac{Q}{2\pi k}\frac{dx}{x}$. The amount of heat loss Q is

((A)) $\frac{\log 2}{70(2\pi k)}$

((B)) $\frac{70(2\pi k)}{\log 2}$

((C)) $-\frac{70(2\pi k)}{\log 2}$

((D)) $\frac{2\pi k}{\log 2}$.

((E))B

((F)) $\frac{70(2\pi k)}{\log 2}$

)1_SCOE//The differential equation of orthogonal trajectories of family of straight lines $y = mx$ is

)$x\ dx - y\ dy = 0$

)$ydx - xdy = 0$

)$x\ dx + ydy = 0$

)$ydx + xdy = 0$

)C

)$x\ dx + ydy = 0$

))1_SCOE//The orthogonal trajectories of the family of straight lines $y = mx$ is

))$x^2 - y^2 = c^2$

))$x^2 = my^2$

))$y^2 = m^2x^2$

))$x^2 + y^2 = c^2$

))D

))$x^2 + y^2 = c^2$

)1_SCOE//The set of orthogonal trajectories to a family of curves whose DE is $\phi\left(x, y, \frac{dy}{dx}\right) = 0$ is
ained by DE

)$\phi\left(x, y, x\frac{dy}{dx}\right) = 0$

))$\phi\left(x, y, \frac{-dx}{dy}\right) = 0$

))$\phi\left(x, y, \frac{dy}{dx}\right) = 0$

))$\phi\left(x, y, \frac{-dy}{dx}\right) = 0$

))B

))$\phi\left(x, y, \frac{-dx}{dy}\right) = 0$

))1_SCOE//For finding orthogonal trajectory of $f(x, y, c) = 0$ we replace $\frac{dy}{dx}$ by

)$-dx/dy$

)$-dy/dx$

)$2dx/dy$

)dy/dx

)B

)$-dy/dx$

)1_SCOE//The DE for the orthogonal trajectory of the family of curves $x^2 + 2y^2 = c^2$ is

)$x + 2y\frac{dy}{dx} = 0$

)$2\frac{dx}{x} = \frac{dy}{y}$

)$xdx + ydy = 0$

)$\frac{dx}{x} = \frac{dy}{y}$

)B

)$2\frac{dx}{x} = \frac{dy}{y}$

)1_SCOE//The DE of orthogonal trajectory of the family of curves $r^2 = a\sin 2\theta$ is

)$\frac{dr}{r} = -\tan 2\theta\, d\theta$

)$\frac{dr}{r} = \tan 2\theta\, d\theta$

)$dr = \tan 2\theta\, d\theta$

)None of these

)A

)$\frac{dr}{r} = -\tan 2\theta\, d\theta$

)1_SCOE//The DE of orthogonal trajectory of the family of curves $r^2 = a^2\cos 2\theta$ is

)$r\frac{d\theta}{dr} = \tan 2\theta$

)$rdr = \tan 2\theta\, d\theta$

)$rdr = \cot 2\theta\, d\theta$

)$rdr + \tan\theta\, d\theta = 0$

)A

)$r\frac{d\theta}{dr} = \tan 2\theta$

)1_SCOE//If the DE of orthogonal trajectory of a curve is $r\frac{d\theta}{dr} + \cot(\theta/2) = 0$ then its orthogonal ectory is

)$r = \cos\theta$

)$r = c(1 - \sin\theta)$

)$r = c(1 - \cos\theta)$

)$r = b(1 + \cos\theta)$

)D

)$r = b(1 + \cos\theta)$

)1_SCOE//If temperature of surrounding medium is θ_0 and temperature of body at any time t is
hen in a process of heating $d\theta/dt$ is

)$\theta - \theta_0$

)$k(\theta - \theta_0);\ \ k > 0$

)$-k(\theta - \theta_0);\ \ k > 0$

)None of these

)B

)$k(\theta - \theta_0);\ \ k > 0$

)1_SCOE//A man invests Rs. 5000 at the rate of 6% per annum , interest being compounded
tinuously and if x be the amount after t year then

)$\frac{dx}{dt} = \frac{6}{100}x$

)$\frac{dx}{dt} = \frac{100}{6}x$

)$\frac{dx}{dt} = x$

)$\frac{dx}{dt} = 6x$

)A

)

)1_SCOE//Two families of the curves are said to be orthogonal if every member of either family
s each member of other family at an angle

)0^0

)90^0

)180^0

)None of these

)B

)

)1_SCOE//To find orthogonal trajectories for the family $f(x, y, c) = 0$ we replaced $\frac{dy}{dx}$ by

)$\frac{dx}{dy}$

)$-\frac{dx}{dy}$

)$\frac{d^2y}{dx^2}$

)None of these

)B

)

)1_SCOE//To find the orthogonal trajectories for the family of curves $f(r, \theta, a) = 0$ we replace $\frac{dr}{d\theta}$

)$-\frac{d\theta}{dt}$

)$-\frac{dr}{d\theta}$

)$-r^2\frac{d\theta}{dr}$

)$r^2\frac{d\theta}{dr}$

)C

)

)1_SCOE//If θ is temperature of body and θ_0 is temperature of surrounding air then newton's
of cooling is

)$\frac{d\theta}{dt} \propto \theta_0$

)$\frac{d\theta}{dt} \propto \theta$

)$\frac{d\theta}{dt} \propto (\theta - \theta_0)$

)None of these

)C

)

)1_SCOE//If the is heated at the rate of ‘ αt ’ and cooling at the rate of ‘$K\theta$’ then which of the owing is correct by newton’s law of cooling ?

)$\frac{d\theta}{dt} = k\theta + \alpha t$

)$\frac{d\theta}{dt} = -k\theta - \alpha t$

)$\frac{d\theta}{dt} = -k\theta + \alpha t$

)$\frac{d\theta}{dt} = k\theta - \alpha t$

)C

)

)1_SCOE//If θ_0 is temperature of surrounding air and θ is temperature of body then which of following is solution of differential equation

$$\frac{d\theta}{\theta - \theta_0} = -kdt \quad ?$$

)$\theta = \theta_0 + ce^{-kt}$

)$\theta = -\theta_0 + ce^{kt}$

)$\theta = - \theta_0 + ce^{kt}$

)None of these

)A

)

)1_SCOE//If temperature of surrounding medium is θ_0 and temperature of body at any time t is hen in a process of heating $d\theta/dt$ is

)$\theta - \theta_0$

)$k(\theta - \theta_0);\ \ k > 0$

)$-k(\theta - \theta_0);\ \ k > 0$

)None of these

)B

)

)1_SCOE// The orthogonal trajectories of the family of straight lines $y = mx$ is

)$x^2 - y^2 = c^2$

)$x^2 = my^2$

)$y^2 = m^2x^2$

)$x^2 + y^2 = c^2$

)D

)

)1_SCOE//The set of orthogonal trajectories to a family of curves whose DE is $\phi\left(x, y, \frac{dy}{dx}\right) = 0$ is ained by DE

)$\phi\left(x, y, x\frac{dy}{dx}\right) = 0$

)$\phi\left(x, y, \frac{-dx}{dy}\right) = 0$

)$\phi\left(x, y, \frac{dy}{dx}\right) = 0$

)$\phi\left(x, y, \frac{-dy}{dx}\right) = 0$

)B

)

)1_SCOE//For finding orthogonal trajectory of $f(x, y, c) = 0$ we replace $\frac{dy}{dx}$ by

)$-dx/dy$

)$-dy/dx$

)$2dx/dy$

)dy/dx

)B

)

)1_SCOE//Voltage drop across inductance L is given by

))Li

))$L\frac{di}{dt}$

)) $\frac{dL}{dt}$

))None of these

))B

))$L\frac{di}{dt}$

)1_SCOE//The linear form of DE for R-L series circuit with emf E is

)$L\frac{di}{dt} + Ri = E$

)$\frac{di}{dt} + \frac{R}{L}i = \frac{E}{L}$

)$L\frac{di}{dt} + Ri = 0$

)None of these

)B

)$\frac{di}{dt}+\frac{R}{L}i=\frac{E}{L}$

))1_SCOE//If $i=\frac{E}{R}+ke^{-\frac{Rt}{L}}$ then the maximum value of i is

) R/L

)E/R

)−E/R

)2R/L

)B

)E/R

)1_SCOE//The linear form of DE for R-C series circuit with emf E is

)$Ri+\frac{q}{c}=E(t)$

)$Ri+\frac{1}{C}\int i\,dt=E$

)$R\frac{di}{dt}+\frac{i}{C}=\frac{dE}{dt}$

)$\frac{di}{dt}+\frac{i}{RC}=\frac{1}{R}\frac{dE}{dt}$

)D

)$\frac{di}{dt}+\frac{i}{RC}=\frac{1}{R}\frac{dE}{dt}$

))1_SCOE//If $i=\frac{E}{R}\left(1-e^{-\frac{Rt}{L}}\right)$ then the 50% of maximum current is

)E/R

)E/2R

)2E/R

)2R/E

)B

)E/2R

)1_SCOE// Which one of the following is not correct?

((A))$F = ma$

((B))$F = m\frac{dv}{dt}$

((C))$F = m\,v\frac{dv}{dx}$

((D))$F = m\,v\frac{dv}{dt}$

((E))D

((F))$F = m\,v\frac{dv}{dt}$

)1_SCOE//A motion of a body or particle along straight line is known as

((A))rectilinear motion

((B))curvilinear motion

((C))motion

((D))None of these

((E))A

((F))rectilinear motion

)1_SCOE//If a body of mass m falling from rest is subjected to the force of gravity and an air
stance proportional to the square of velocity kv^2, then the equation of motion is

((A))$mv\frac{dv}{dx} = mg + kv^2$

((B))$ma = -mg + kv^2$

((C))$ma = mg - kv^2$

((D))None of these

((E))C

((F))$ma = mg - kv^2$

)1_SCOE//If a body opposed by force per unit mass of value cx and resistance per unit mass of
ue kv^2 then the equation of motion is

((A))$a = cx - bv^2$

((B))$a = bv^2 - cx$

((C))$v\frac{dv}{dx} = -cx - bv^2$

((D))$v\frac{dv}{dx} = cx + bv^2$

((E))C

((F))$v\frac{dv}{dx} = -cx - bv^2$

)1_SCOE//Let O be a fixed point on a straight line. Let P be the position of particle at any time t OP=x. Then the equation of SHM is

((A))$\frac{d^2x}{dt^2} = -kx$

((B))$\frac{d^2x}{dt^2} = kx$

((C))$\frac{dv}{dx} = kx^2$

((D))None of these

((E))A

((F))$\frac{d^2x}{dt^2} = -kx$

)1_SCOE//In SHM, $v^2 = -3x^2 + 112$, then its greatest acceleration is

((A))$\sqrt{336}$

((B))$\sqrt{333}$

((C))$\sqrt{330}$

((D))$\sqrt{363}$

((E))A

((F))$\sqrt{336}$

)1_SCOE//The quantity of heat in a body is proportional to its

((A))mass only

((B))temperature only

((C))mass and temperature

((D))none of these

((E))C

((F))mass and temperature

)1_SCOE//If $\frac{d^2x}{dt^2} = -\omega^2 x$ is differential equation of SHM then period T is

((A))$2\pi/\omega$

((B))$2\pi/\sqrt{\omega}$

((C))π/ω

((D))$-2\pi/\omega$

((E))A

((F))$2\pi/\omega$

)1_SCOE//The motion of a particle moving along a straight line is $\frac{d^2x}{dt^2} + 16x = 0$, then its period

((A))$2\pi/\sqrt{2}$

((B))$\pi/2$

((C))2π

((D))π

((E))B

((F))$\pi/2$

)1_SCOE//If $\frac{d^2x}{dt^2} = -\omega^2 x$ is differential equation of SHM then frequency of SHM is

((A))$2\pi/\sqrt{k}$

((B))$\sqrt{k}/2\pi$

((C))$2\pi/k$

((D))$k/2\pi$

((E))B

((F)$\sqrt{k}/2\pi$

)1_SCOE//The particle executing SHM has maximum acceleration when

((A))displacement is zero

((B))velocity is maximum

((C))displacement is maximum

((D))velocity is zero

((E))D

((F))velocity is zero

((Q))1_SCOE//Rectilinear motion is a motion of body along a

((A))Straight line

((B))circular path

((C))parabolic path

((D))none of these

((E))A

((F))Straight line

((Q))1_SCOE//A particle moving in a straight line with acceleration k$(x + a4/x3)$ directed towards the origin .The equation of motion is

((A)) $\frac{dv}{dx}=-k\left[\frac{a^4}{x^3}+x\right]$

((B))v $\frac{dv}{dx}=k\left[\frac{a^4}{x^3}+x\right]$

((C))v $\frac{dv}{dx}=-k\left[\frac{a^4}{x^3}+x\right]$

((D)) $\frac{dv}{dx}=k\left[\frac{a^4}{x^3}+x\right]$

((E))C

((F))v $\frac{dv}{dx}=-k\left[\frac{a^4}{x^3}+x\right]$

((Q))1_SCOE//A particle is projected vertically upward with velocity v_1 and resistance of air produces retardation (kv^2) where v is velocity. The equation of motion is

((A)) $v\frac{dv}{dx}$ =-g – kv^2

((B)) $v\frac{dv}{dx}$ =-g + kv^2

((C)) $v\frac{dv}{dx}$ = – kv^2

((D)) $v\frac{dv}{dx}$ =g – kv^2

((E))A

((F)) $v\frac{dv}{dx}$ =-g – kv^2

((Q))1_SCOE//A body of mass m falls from rest under gravity ,in a fluid whose resistance to motion at any time t is mk times its velocity where k is constant. The D.E. of motion is

((A)) $\frac{dv}{dt}$=-g-kv

((B)) $\frac{dv}{dt}$=g-kv

((C)) $\frac{dv}{dt}$=g+kv

((D)) $\frac{dv}{dt}$=mg-mkv

((E))B

((F)) $\frac{dv}{dt}$=g-kv

((Q))1_SCOE//Let O be a fixed point on a straight line . Let P be the position of particle at any time t and OP = X . Then the equation of S.H.M is

((A))$\frac{d^2x}{dt^2} = -kx$

((B))$\frac{d^2x}{dt^2} = kx$

((C))$\frac{dv}{dx} = kx^2$

((D))None of these

((E))A

((F))

((Q))1_SCOE//The quantity of heat in a body is proportional to it's

((A))mass only

((B))temperature only

((C))mass and temperature

((D))none of these

((E))C

((F))

((Q))1_SCOE//The formula for heat flow is

((A))Q = Thermal conductivity x temperature gradient

((B))Q = Thermal conductivity x Area x Temperature Gradient

((C))Q = Area x Temperature Gradient

((D))Q = Thermal conductivity x Area

((E))B

((F))

((Q))1_SCOE//Let T be a temperature in the insulation at the radius r , then the temperature gradient is

((A))$\frac{dT}{dS}$

((B))$\frac{dT}{dr}$

((C))$\frac{dT}{dt}$

((D))$\frac{dT}{d\theta}$

((E))B

((F))

((Q))1_SCOE//Which of the following is active element in the circuit ?

((A))Resistance

((B))Inductance

((C))Capacitance

((D))Generator

((E))D

((F))

((Q))1_SCOE//Which of the following is passive element in the circuit ?

((A))Battery

((B))Generator

((C))Resistance

((D))None of these

((E))C

((F))

((Q))1_SCOE//If ‘ i’ is current flowing in a loop and ‘ R ‘ is resistance then voltage drop across R is

((A))Ri

((B))R/i

((C))Rq

((D))$R\frac{di}{dt}$

((E))A

((F))

((Q))1_SCOE//The voltage drop across inductance L(i current) is

((A))Li

((B))$L\frac{di}{dt}$

((C))$L\ \frac{dq}{dt}$

((D))None of these

((E))B

((F))

((Q))1_SCOE//If q is charge on condenser of capacity ‘C’ then voltage drop across C is

((A))qC

((B)) $\frac{q}{C}$

((C))$q\frac{di}{dt}$

((D))None of these

((E))B

((F))

((Q))1_SCOE//If R , L & voltage source E connected in series then the differential equation is

((A))$L\frac{di}{dt} + Ri = E$

((B))$\frac{di}{dt} + R = E$

((C))$R\frac{di}{dt} + Li = E$

((D))$\frac{di}{dt} + \frac{L}{R} = \frac{E}{R}$

((E))A

((F))

((Q))1_SCOE//The differential equation for R-C circuit with voltage source E(t) is

((A))$Ri + \frac{q}{C} = E(t)$

((B))$R\frac{dq}{dt} + i = \ E(t)$

((C))$\frac{R}{C} + \frac{dq}{dt} = E(t)$

((D))None of these

((E))A

((F))

((Q))1_SCOE//if i is current L is inductance & C is capacitance in series without e.m.f in a closed circuit then differential equation is

((A))$L\frac{di}{dt} + \frac{q}{C} = 0$

((B))$L\frac{di}{dt} + \frac{C}{q} = 0$

((C))$\frac{di}{dt} + LC = 0$

((D))$C\frac{di}{dt} + Li = 0$

((E))A

((F))

((Q))1_SCOE//The equation of motion for a body of mass m falling from rest , subjected to force of gravity and an air resistance Kv^2 is

((A))$mv\frac{dv}{dx} = mg - kv^2$

((B))$ma = -mg + kv^2$

((C))$mv\frac{dv}{dx} = -mg - kv^2$

((D))$None\ of\ these$

((E))A

((F))

((Q))1_SCOE//If F is force of attraction between two particles the distance r apart then Newton's law of gravitation is

((A))$F \propto \frac{1}{r}$

((B))$F \propto \frac{1}{r^2}$

((C))$F \propto r$

((D))None of these

((E))B

((F))

((Q))1_SCOE//If the equation in the theory of stability of an airplane is

$\frac{dv}{dt} = gcos\theta - kv$ where $g_1, \theta\ , k\ are\ constants)\ then\ velocity\ v\ is$

((A))$\frac{gcos\theta}{k}(1 - e^{-kt})$

((B))$\frac{kcos\theta}{g}(1 - e^{kt})$

((C))$\frac{g}{k}cos\theta(1 - e^{kt})$

((D))None of these

((E))A

((F))

((Q))1_SCOE//The differential equation for the particle executing S.H.M is

((A))$\frac{d^2x}{dt^2} = \omega^2 x$

((B))$\frac{d^2x}{dt^2} = -\omega^2 x$

((C))$\frac{dv}{dt} = \omega x$

((D))None of these

((E))B

((F))

((Q))1_SCOE//The particle executing S.H.M has maximum acceleration when

((A))Displacement is zero

((B))Velocity is zero

((C))velocity is maximum

((D))displacement is maximum

((E))B

((F))

((Q))1_SCOE//If the particle executing S.H.M then maximum displacement on either side of mean position is called

((A))Velocity

((B))acceleration

((C))amplitude

((D))Frequency

((E))C

((F))

((Q))1_SCOE//If q is the heat flow through an area $A\ (cm^2)\ then$ which of the following is Fourier Law of heat conduction ?

((A))$q = KA\frac{dT}{dx}$

((B))$q = -KA\frac{dT}{dx}$

((C))$q = -KA\frac{dx}{dT}$

((D))$q = -KA$

((E))B

((F))

((Q))1_SCOE//In the conduction of heat which of the following is correct ?

((A))Heat flows from lower temperature to higher temperature

((B))Heat flows from higher temperature to lower temperature

((C))Heat flows from higher temperature to higher temperature

((D))None of the above correct.

((E))B

((F))

((Q))1_SCOE//If we put $\frac{dv}{dt} = v$ in differential equation $\frac{d^2u}{dr^2} + 2\frac{du}{dr} = 0$ then solution is

((A))$v = \frac{c}{r}$

((B))$v = \frac{c}{r^2}$

((C))$u = \frac{c}{r^2}$

((D))$u = \frac{c}{r}$

((E))B

((F))

((Q))1_SCOE//The solution of differential equation $\frac{d}{dr}\left(r\frac{dT}{dr}\right)$ for one dimensional steady heat conduction is

((A))$T = c_1 \log r + c_2$

((B))$r = c_1 logT + c_2$

((C))$T = \frac{c_1}{r} + c_2$

((D))None of these

((E))A

((F))

((Q))1_SCOE//The equation of motion for a bullet fired into sand tank with retardation proportional to square root of it's velocity is

((A))$mv = -mk\sqrt{v}$

((B))$mx = -mk\sqrt{v}$

((C))$m\frac{dv}{dt} = -mk\sqrt{v}$

((D))$m\frac{dv}{dt} = mk\sqrt{v}$

((E))C

((F))

((Q))1_SCOE//The equation of motion for the particle moving in a straight line with acceleration $k\left(x + \frac{a^4}{x^3}\right)$ Directed towards origin is

((A))$v\frac{dv}{dx} = k\left(x + \frac{a^4}{x^3}\right)$

((B))$v\frac{dv}{dx} = -k\left(x + \frac{a^4}{x^3}\right)$

((C))$v = -k\left(x + \frac{a^4}{x^3}\right)$

((D))None of these

((E))B

((F))

((Q))1_SCOE//The differential equation for a particle falling through a distance x (neglecting air resistance) is

((A))$\frac{dx}{dt} = g$

((B))$\frac{d^2x}{dt^2} = g$

((C))$v\frac{dv}{dt} = g$

((D))None of these

((E))B

((F))

((Q))1_SCOE//Which of the following is kirchhoff's law around any closed loop ?

((A))The sum of voltage drops is equal to total e.m.f. applied.

((B))The sum of voltage drops is equal to the current

((C))The sum of voltage drops is equal to the charge on condenser.

((D))None of these

((E))A

((F))

((Q))1_SCOE//The linear form of DE for R-L series circuit with emf E is

((A))$L\frac{di}{dt} + Ri = E$

((B))$\frac{di}{dt} + \frac{R}{L}i = \frac{E}{L}$

((C))$L\frac{di}{dt} + Ri = 0$

((D))none of these

((E))B

((F))

((Q))1_SCOE//The linear form of DE for R-C series circuit with emf E is

((A))$Ri + \frac{q}{c} = E(t)$

((B))$Ri + \frac{1}{C}\int i\,dt = E$

((C))$R\frac{di}{dt} + \frac{i}{C} = \frac{dE}{dt}$

((D))$\frac{di}{dt} + \frac{i}{RC} = \frac{1}{R}\frac{dE}{dt}$

((E))D

((F))

((Q))1_SCOE//Which one of the following is not correct?

((A))$F = ma$

((B))$F = m\frac{dv}{dt}$

((C))$F = m\,v\frac{dv}{dx}$

((D))$F = m\,v\frac{dv}{dt}$

((E))D

((F))

((Q))1_SCOE//A motion of a body or particle along straight line is known as

((A))rectilinear motion

((B))curvilinear motion

((C))Motion

((D))None of these

((E)) A

((F))

((Q))1_SCOE//If a body of mass m falling from rest is subjected to the force of gravity and an air resistance proportional to the square of velocity kv^2, then the equation of motion is

((A))$mv\frac{dv}{dx} = mg + kv^2$

((B))$ma = -mg + kv^2$

((C))$ma = mg - kv^2$

((D))None of these

((E))C

((F))

((Q))1_SCOE// Let O be a fixed point on a straight line. Let P be the position of particle at any time t and OP=x. Then the equation of SHM is

((A))$\frac{d^2x}{dt^2} = -kx$

((B))$\frac{d^2x}{dt^2} = kx$

((C))$\frac{dv}{dx} = kx^2$

((D))None of these

((E))A

((F))

((Q))1_SCOE//In SHM, $v^2 = -3x^2 + 112$, then its greatest acceleration is

((A))$\sqrt{336}$

((B))$\sqrt{333}$

((C))$\sqrt{330}$

((D))$\sqrt{363}$

((E))A

((F))

((Q))1_SCOE//The quantity of heat in a body is proportional to its

((A))mass only

((B))temperature only

((C))mass and temperature

((D))none of these

((E))C

((F))

((Q))1_SCOE//The motion of a particle moving along a straight line is $\frac{d^2x}{dt^2} + 16x = 0$, then its period is

((A))$2\pi/\sqrt{2}$

((B))$\pi/2$

((C))2π

((D))π

((E))B

((F))

((Q))1_SCOE//If $\frac{d^2x}{dt^2} = -\omega^2 x$ is differential equation of SHM then frequency of SHM is

((A))$2\pi/\sqrt{k}$

((B))$\sqrt{k}/2\pi$

((C))$2\pi/k$

((D))$k/2\pi$

((E)) B

((F))

((Q))1_SCOE//The particle executing SHM has maximum acceleration when

((A))displacement is zero

((B))velocity is maximum

((C))displacement is maximum

((D))velocity is zero

((E))D

((F))

((Q))1_SCOE//An ice ball melts. The rate at which it melts is proportional to the amount of the ice at that time. If half of the quantity of ice melts in 20 minutes then after one hour the amount of ice left will be

((A))$1/8^{th}$ of the original

((B))1/4th of the original

((C))1/3rd of the original

((D))Nothing will be left

((E))A

((F))

((Q))1_SCOE//Let the population of country be decreasing at the rate proportional to its population. If the population has decreased to 25% in 10 years, how long will it take to half.

((A))20 years

((B))8.3 years

((C))15 years

((D))5 years

((E))B

((F))

((Q))1_SCOE//Voltage drop across inductance L is given by

((A))Li

((B))$L\frac{di}{dt}$

((C))$\frac{dL}{dt}$

((D))None of these

((E))B

((F))

((Q))2_SCOE//If $I_n = \int_0^{\pi/4} \tan^n x\, dx$ then the value of $I_n + I_{n+2}$ is

((A))$n + 1$

((B))n

((C))$1/(n + 1)$

((D))$1/n$

((E))C

((F))

((Q))2_SCOE//If $I_n = \int_{\pi/4}^{\pi/2} \cot^n x\, dx$ and $I_n = \frac{1}{n-1} - I_{n-2}$, then the value of I_6 is

((A))$\frac{13}{15}$

((B))$\frac{13}{15} + \frac{\pi}{4}$

((C))$\frac{13}{15} - \frac{\pi}{4}$

((D))$\frac{13}{15} - \frac{\pi}{2}$

((E))C

((F))

((Q))2_SCOE//If $I_n = \int_0^{\pi/4} \sin^{2n} x \;\, dx$ and $I_n = \left(1 - \frac{1}{2n}\right) I_{n-1} - \frac{1}{n2^{n+1}}$, then the value of $\int_0^{\pi/4} \sin^4 x \;\, dx$ is

((A))$\frac{3\pi}{32} + \frac{1}{4}$

((B))$\frac{3\pi}{32} - \frac{1}{4}$

((C))$\frac{\pi}{16} - \frac{1}{4}$

((D))$\frac{3\pi}{16} + \frac{1}{4}$

((E))B

((F))

((Q))2_SCOE//If $I_{m,n} = \int_0^{\pi/2} (\cos^{\mathrm{m}} x)(\sin nx) dx$ and $I_{m,n} = \frac{1+m\, I_{m-1,n-1}}{m+n}$, then the value of $\int_0^{\pi/2} (\cos^2 x)(\sin 4x) dx$ is

((A))3

((B))2

((C))1/3

((D))2/3

((E))C

((F))

((Q))2_SCOE//If $I_n = \int_0^{\pi/2} x \cdot \sin^n x \cdot dx$ and $I_n = \frac{n-1}{n} I_{n-2} + \frac{1}{n^2}$, then the value of $\int_0^{\pi/2} x \cdot \sin^4 x \cdot dx$

((A))$\frac{3\pi^2}{64} + \frac{1}{4}$

((B))$\frac{\pi^2}{64} + \frac{1}{4}$

((C))$\frac{3\pi^2}{32} - \frac{1}{4}$

((D))$\frac{3\pi^2}{64} - \frac{1}{4}$

((E))A

((F))

((Q))2_SCOE//If $I_n = \int_0^{\pi/2} x \cdot \sin^n x \cdot dx$ and $I_n = \frac{n-1}{n} I_{n-2} + \frac{1}{n^2}$, then the value of $\int_0^{\pi/2} x \cdot \sin^3 x \cdot dx$

((A))5/3
((B))1/9
((C))7/9
((D))3/4
((E))B

((F))

((Q))2_SCOE//If $I_n = \int_0^{\infty} e^{-ax} \sin^{\mathrm{n}} x\, dx$ and $(n^2 + a^2)I_n = n(n-1)I_{n-2}$, then the value of $\int_0^{\infty} e^{-2x} \sin^4 x\, dx$

((A))3/20
((B))3/40
((C))40/3
((D))3
((E))B

((F))

((Q))2_SCOE//If $I_n = \int_0^{\infty} e^{-ax} \sin^{\mathrm{n}} x\, dx$ and $I_n = \frac{n(n-1)}{n^2+a^2} I_{n-2}$ then the value of $\int_0^{\infty} e^{-2x} \sin^2 x\, dx$ is

((A))½
((B))¼
((C))1/8
((D))2
((E))A

((F))

((Q))2_SCOE// The value of integral $I_n = \int_0^{\pi/4} \sin^7(2\theta)\, d\theta$ is equal to

((A))$\frac{8}{35}\pi$

((B))$\frac{8}{35}$

((C))$\frac{16}{35}$

((D))$\frac{8}{15}$

((E))B

((F))

((Q))2_SCOE//The value of integral $I_n = \int_0^{\pi/6} \cos^6(3\theta)\, d\theta$ is equal to

((A))$\frac{5\pi}{96}$

((B))$\frac{7}{48}$

((C))$\frac{5}{96}$

((D))$\pi/96$

((E))A

((F))

((Q))2_SCOE//If $U_n = \int_0^{\pi/2} \tan^n(x)\, dx$,and $U_n = \frac{1}{n-1} U_{n-2}$ Then I_4 is equal to

((A))$-\frac{2}{3} + \frac{\pi}{4}$

((B)) $-\frac{2}{3} - \frac{\pi}{4}$

((C)) $\frac{2}{3} + \frac{\pi}{4}$

((D)) $\frac{2}{3} - \frac{\pi}{4}$

((E))A

((F))

((Q))2_SCOE//If $I_n = \int_0^{\pi/2} x \cos^n(x)\, dx$ and $I_n = -\frac{1}{n^2} + \frac{n-1}{n} I_{n-2}$ then I_3 is equal to

((A)) $-\frac{2}{3} + \frac{\pi}{3}$

((B))$-\frac{7}{9} + \frac{\pi}{3}$

((C)) $-\frac{7}{9} - \frac{\pi}{3}$

((D)) $\frac{7}{9} + \frac{\pi}{3}$

((E))B

((F))

((Q))2_SCOE//If $I_n = \int_0^{\pi/4} \sin^{2n}(x)\, dx\ I_n = -\frac{1}{n2^{n+1}} + \frac{2n-1}{2n} I_{n-1}$then $I_2$is equal to

((A)) $\frac{1}{4} + \frac{3\pi}{12}$

((B)) $-\frac{1}{4} - \frac{3\pi}{12}$

((C)) $-\frac{1}{4} + \frac{5\pi}{16}$

((D))$-\frac{1}{4} + \frac{3\pi}{12}$

((E))D

((F))

((Q))2_SCOE//If $I_n = \int_0^{\pi/2} \theta \sin^{\mathrm{n}}(\theta)\, d\theta$ and $I_n = \frac{n-1}{n} I_{n-2} + \frac{1}{n^2}$ Then the value of I_5

((A)) $\frac{149}{225} + \frac{\pi}{2}$

((B)) $\frac{149}{225} + \frac{\pi}{4}$

((C))$\frac{149}{225}$

((D)) $\frac{149}{225} + \pi$

((E))C

((F))

((Q))2_SCOE//If $I_n = \int_0^{\pi/4} \sec^n(\theta)\, d\theta$, and $I_n = \frac{(\sqrt{2})^{n-2}}{n-1} + \frac{n-2}{n-1} I_{n-2}$ then $I_n = \int_0^{\pi/4} \sec^6(\theta)\, d\theta$ is equal to

((A))$-\frac{28}{15}$

((B))$\frac{28}{15}$

((C))$\frac{15}{28}$

((D))$\frac{7}{30}$

((E))B

((F))

((Q))2_SCOE//If $U_n = \int x^n e^x\, dx$ then which of the following is true

((A))$U_n = x^n e^x - nU_{n-1}$

((B)) $U_n = x^n e^x - (n-1)U_{n-1}$

((C)) $U_n = x^n e^x - nU_{n-2}$

((D)) $U_n = x^n e^x - (n-1)U_{n-2}$

((E))A

((F))

((Q))2_SCOE//The value of the integral $\int_0^\infty \frac{x^5}{5^x} dx$ by using substitution $5^x = e^t$ is

((A))$120/(\log 5)^4$

((B))$24/(\log 4)^5$

((C))$120/(\log 5)^6$

((D))$24/(\log 4)^4$

((E))C

((F))

((Q))2_SCOE//The value of the integral $\int_0^\infty \frac{dx}{\sqrt{x \log\left(\frac{1}{x}\right)}}$ by using the substitution $\log\left(\frac{1}{x}\right) = t$ is

((A))$\sqrt{\pi}/2$

((B))$\sqrt{2\pi}$

((C))$\sqrt{\pi}$

((D))$2\sqrt{\pi}$

((E))B

((F))

((Q))2_SCOE//Value of $\int_0^{\pi/2} \sqrt{\tan x}\, dx$ is

((A))$\frac{1}{2} B\left(\frac{3}{4}, \frac{1}{4}\right)$

((B))$\frac{1}{2} B\left(\frac{3}{4}, \frac{3}{4}\right)$

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

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

((E))A

((F))

((Q))2_SCOE//Value of $\int_0^{\pi/2} \sqrt{\cot x}\, dx$ is

((A))$\frac{1}{2} B\left(\frac{3}{4}, \frac{1}{4}\right)$

((B))$\frac{1}{2} B\left(\frac{3}{4}, \frac{3}{4}\right)$

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

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

((E))A

((F))

((Q))2_SCOE//Value of $\int_0^{\pi/2} \sqrt{2 \sin 2x}\, dx$ is

((A))$\frac{1}{2} B\left(\frac{3}{4}, \frac{1}{4}\right)$

((B))$\frac{1}{2} B\left(\frac{3}{4}, \frac{3}{4}\right)$

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

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

((E))C

((F))

((Q))2_SCOE//If $B(n,2)=\frac{1}{6}$ and n is a positive integer then value of n is

((A))1

((B))2

((C))3

((D))4

((E))B

((F))

((Q))2_SCOE//If $B(n+1,1)=\frac{1}{4}$ and n is a positive integer then value of n is

((A))1

((B))2

((C))3

((D))4

((E))C

((F))

((Q))2_SCOE//The value of the integral $\int_0^\infty e^{-h^2x^2}\,dx$ by expressing in to gamma function is

((A))$\frac{h}{2}\Gamma\frac{1}{2}$

((B)) $\frac{h}{2}\Gamma-\frac{1}{2}$

((C))$\frac{\sqrt{\pi}}{h^2}$

((D)) $\frac{\sqrt{\pi}}{2h}$

((E))D

((F))

((Q))2_SCOE// The value of the integral $\int_0^\infty \sqrt{y}e^{-y^2}\,dy$ by expressing in to gamma function is

((A))$\frac{1}{3}\sqrt{\pi}$

((B))$\frac{1}{2}\Gamma\frac{1}{2}$

((C))$\sqrt{\pi}$

((D))$\frac{\sqrt{\pi}}{2}$

((E))A

((F))

((Q))2_SCOE// The value of the integral $\int_0^\infty xe^{-\sqrt{x}}\,dy$ is

((A))8

((B))48

((C))12

((D))6

((E))C

((F))

((Q))2_SCOE// The value of the integral $\int_0^\infty e^{-x^4}\,dx$ is

((A))$\frac{1}{4}\,\Gamma\left(\frac{1}{4}\right)$

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

((C))$\frac{1}{4}\Gamma\left(\frac{5}{4}\right)$

((D)) $\Gamma\left(\frac{1}{4}\right)$

((E))A

((F))

((Q))2_SCOE// The value of the integral $\int_0^\infty \frac{x^5}{5^x}\,dx$ is

((A))$\frac{\Gamma(6)}{(\log(6))^6}$

((B)) $\frac{\Gamma(6)}{(\log(6))^5}$

((C)) $\frac{\Gamma(5)}{(\log(6))^5}$

((D)) $\frac{\Gamma(6)}{(\log(5))^6}$

((E))D

((F))

((Q))2_SCOE//The value of the integral $\int_0^\infty x^7\, e^{-2x^2}\,dx$ reduces in the form

((A))$\frac{1}{16}\int_0^\infty e^{-t}t^2dt$

((B)) $\frac{1}{32}\int_0^\infty e^{-t}t^3dt$

((C)) $\frac{1}{8}\int_0^\infty e^{-t}t^4dt$

((D)) $\frac{1}{32}\int_0^\infty e^{-t}t^2dt$

((E))B

((F))

((Q))2_SCOE//The value of the integral $\int_0^\infty x^7\, e^{-2x^2} dx$ reduces in the form $\frac{1}{32}\int_0^\infty e^{-t} t^3 dt$ hence value of integral is

((A))$\frac{3}{4}$

((B))$\frac{1}{16}$

((C))$\frac{3}{32}$

((D))$\frac{3}{16}$

((E))D

((F))

((Q))2_SCOE//The value of the integral $\int_0^\infty \frac{x^a}{a^x} dx$ is

((A))$\frac{\Gamma(\mathrm{a+1})}{(loga)^{a+1}}$

((B)) $\frac{\Gamma(\mathrm{a})}{(loga)^{a}}$

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

((D)) $\frac{\Gamma(\mathrm{a-1})}{(loga)^{a}}$

((E))a

((F))

((Q))1_SCOE//The value of the integral $\int_0^{\pi} \sin^{\mathrm{n}} x\, dx$, for even n is

((A))$\frac{(n-1)\cdot(n-3)\cdot\cdots\cdot 3\cdot 1}{(n)\cdot(n-2)\cdot\cdots\cdot 4\cdot 2}\cdot\pi$

((B))$\frac{(n-1)\cdot(n-3)\cdot\cdots\cdot 3\cdot 1}{(n)\cdot(n-2)\cdot\cdots\cdot 4\cdot 2}\cdot\frac{\pi}{2}$

((C))$\frac{(n-1)\cdot(n-3)\cdot\cdots\cdot 3\cdot 1}{(n)\cdot(n-2)\cdot\cdots\cdot 4\cdot 2}\cdot 2\pi$

((D))0

((E))A

((F))

((Q))1_SCOE//The value of the integral $\int_0^{\pi} \cos^{\mathrm{n}} x\, dx$, for odd n is

((A))$\frac{(n-1)\cdot(n-3)\cdot\cdots\cdot 3\cdot 1}{(n)\cdot(n-2)\cdot\cdots\cdot 4\cdot 2}\cdot\pi$

((B))$\frac{(n-1)\cdot(n-3)\cdot\cdots\cdot 3\cdot 1}{(n)\cdot(n-2)\cdot\cdots\cdot 4\cdot 2}\cdot\frac{\pi}{2}$

((C))$\frac{(n-1)\cdot(n-3)\cdot\cdots\cdot 3\cdot 1}{(n)\cdot(n-2)\cdot\cdots\cdot 4\cdot 2}\cdot 2\pi$

((D))0

((E))D

((F))

((Q))1_SCOE//The value of the integral $\int_0^{2\pi} \sin^{\mathrm{n}} x\, dx$, for odd n is

((A))$\frac{(n-1)\cdot(n-3)\cdot\cdots\cdot 3\cdot 1}{(n)\cdot(n-2)\cdot\cdots\cdot 4\cdot 2}\cdot\pi$

((B))$\frac{(n-1)\cdot(n-3)\cdot\cdots\cdot 3\cdot 1}{(n)\cdot(n-2)\cdot\cdots\cdot 4\cdot 2}\cdot\frac{\pi}{2}$

((C))$\frac{(n-1)\cdot(n-3)\cdot\cdots\cdot 3\cdot 1}{(n)\cdot(n-2)\cdot\cdots\cdot 4\cdot 2}\cdot 2\pi$

((D))0

((E))D

((F))

((Q))1_SCOE//The value of the integral $\int_0^{2\pi} \cos^{\mathrm{n}} x\, dx$, for odd n is

((A))$\frac{(n-1)\cdot(n-3)\cdot\cdots\cdot 3\cdot 1}{(n)\cdot(n-2)\cdot\cdots\cdot 4\cdot 2}\cdot\pi$

((B))$\frac{(n-1)\cdot(n-3)\cdot\cdots\cdot 3\cdot 1}{(n)\cdot(n-2)\cdot\cdots\cdot 4\cdot 2}\cdot\frac{\pi}{2}$

((C))$\frac{(n-1)\cdot(n-3)\cdot\cdots\cdot 3\cdot 1}{(n)\cdot(n-2)\cdot\cdots\cdot 4\cdot 2}\cdot 2\pi$

((D))0

((E))D

((F))

((Q))1_SCOE//The value of the integral $\int_0^{\pi/2} \sin^5 x \ dx$ is

((A))$8\pi/30$

((B))$\pi/2$

((C))$8/15$

((D))$15/8$

((E))C

((F))

((Q))1_SCOE//The value of the integral $\int_0^{\pi/2} \cos^6 x \ dx$ is

((A))0

((B))$5/16$

((C))$5/32$

((D))$5\pi/32$

((E))C

((F))

((Q))1_SCOE//The value of the integral $\int_0^{\pi} \sin^5 x \ dx$ is

((A))$8\pi/15$

((B))$\pi/2$

((C))$16/15$

((D))0

((E))C

((F))

((Q))1_SCOE//The value of the integral $\int_0^{\pi} \sin^6 x \ dx$ is

((A))0

((B))$5/16$

((C))$5/32$

((D))$5\pi/32$

((E))B

((F))

((Q))1_SCOE//The value of the integral $\int_0^{2\pi} \cos^5 x \ dx$ is

((A))0

((B))$5/16$

((C))$5/32$

((D))$5\pi/32$

((E))A

((F))

((Q))1_SCOE//The value of the integral $\int_0^{2\pi} \sin^4 x \ dx$ is

((A))$3\pi/16$

((B))0

((C))$3\pi/4$

((D))3/8

((E))C

((F))

((Q))1_SCOE//The value of the integral $\int_0^{\pi/2} \sin^4 x \cos^3 x \ dx$ is

((A))$\pi/35$

((B))2/35

((C))0

((D))53/2

((E))B

((F))

((Q))1_SCOE//The value of the integral $\int_0^{\pi/2} \sin^4 x \cos^4 x \ dx$ is

((A))0

((B))3/128

((C))3/256

((D))$3\pi/256$

((E))D

((F))

((Q))1_SCOE//The value of the integral $\int_0^{\pi} \sin^4 x \cos^3 x \ dx$ is

((A))0

((B))3/128

((C))3/256

((D))$3\pi/256$

((E))A

((F))

((Q))1_SCOE//The value of the integral $\int_0^{2\pi} \sin^4 x \cos^2 x \ dx$ is

((A))$\pi/8$

((B))$\pi/4$

((C))$\pi/2$

((D))0

((E))A

((F))

((Q))1_SCOE//The reduction formula for $\int_0^{\pi/2} \sin^{\mathrm{m}} x \cos^{\mathrm{n}} x\, dx$ is

((A))$I_{m,n} = \frac{n-1}{m+n} I_{m,n-2}$

((B))$I_{m,n} = \frac{n}{m+n} I_{m-1,n-1}$

((C))$I_{m,n} = \frac{n-1}{m+n} I_{m-2,n}$

((D))$I_{m,n} = \frac{n}{m+n} I_{m-2,n-2}$

((E))A

((F))

((Q))1_SCOE//The value of $\int_{-\pi/2}^{\pi/2} \sin^4 x\, dx$ is

((A))$3\pi/16$

((B))$3\pi/8$

((C))$3\pi/4$

((D))0

((E))B

((F))

((Q))1_SCOE//The value of $\int_{-\pi/2}^{\pi/2} \sin^4 x \cos^2 x\, dx$ is

((A))0

((B))$\pi/4$

((C))$\pi/16$

((D))$\pi/32$

((E))C

((F))

((Q))1_SCOE//The value of $\int_{-2\pi}^{2\pi} \sin^3 x \cos^2 x\, dx$ is

((A))0

((B))$\pi/4$

((C))$\pi/16$

((D))$\pi/32$

((E))A

((F))

((Q))1_SCOE//The formula for $\Gamma(\mathrm{n}+1)$ is

((A))$\int_0^\infty e^{-x} x^{n-1} dx$

((B))$\int_0^\infty e^{-x} x^{n} dx$

((C))$2\int_0^\infty e^{-x} x^{n-1} dx$

((D))$\int_0^\infty e^{-x} x^{n-2} dx$

((E))B

((F))

((Q))1_SCOE//The value of the integral $\int_0^\infty e^{-4x} x^3\, dx$ is

((A))4!

((B))3!

((C))$\frac{3!}{64}$

((D))$\frac{3!}{256}$

((E))D

((F))

((Q))1_SCOE//The value of $\Gamma\left(\frac{1}{3}\right)\Gamma\left(\frac{2}{3}\right)$ is

((A))$2\pi/\sqrt{3}$

((B))$\pi/\sqrt{3}$

((C))2π

((D))$2/\sqrt{3}$

((E))A

((F))

((Q))1_SCOE//The value of the integral $\int_0^\infty 3^{-x}\, dx$ is

((A))$1/\log 3$

((B))$-1/\log 3$

((C))$\log 3$

((D))$-\log 3$

((E))A

((F))

((Q))1_SCOE//The value of $\int_0^1 (\log x)^n\, dx$ is

((A))$(-1)^n \Gamma \mathrm{n}$

((B))$(\log n)\Gamma n$

((C))Γn

((D))$\Gamma(n+1)$

((E))A

((F))

((Q))1_SCOE//The value of $\int_0^1 \log x\, dx$ is

((A))1

((B))2
((C))-1
((D))-2
((E))B

((F))

((Q))1_SCOE//The value of $B(3,3)$ is
((A))30
((B))9
((C))1/30
((D))1/9
((E))C

((F))
((Q))1_SCOE//The value of $n \cdot B(m+1,n)$ is
((A))$B(m,n)$
((B))$m \cdot B(m,n)$
((C)) $BB(mm,nn+1)$
((D))$m \cdot B(m,n+1)$
((E))D

((F))
((Q))1_SCOE//By Duplication formula, the value of $\Gamma m \cdot \Gamma(m+\frac{1}{2})$ is
((A))$\frac{\sqrt{\pi}}{2^{m-1}}\Gamma(2m)$
((B))$\frac{\sqrt{\pi}}{2^{2m-1}}\Gamma(m)$
((C))$\frac{\sqrt{\pi}}{2^{m}}\Gamma(2m)$
((D))$\frac{\sqrt{\pi}}{2^{2m-1}}\Gamma(2m)$
((E))D

((F))
((Q))1_SCOE//The value of $\int_0^\infty e^{-4x}x^{3/2}dx$ is
((A))$\frac{3\sqrt{\pi}}{128}$
((B))$\frac{3\pi}{128}$
((C))$\frac{\sqrt{\pi}}{64}$
((D))$\frac{\pi}{64}$

((E))A

((F))

((Q))1_SCOE//The value of the integral $\int_1^\infty \frac{dx}{x^{p+1}(x-1)^q}$ is

((A))$B(p,q)$)

((B))$B(p+q,q)$

((C))$B(p,1-q)$

((D))$B(p+q,1-q)$

((E))D

((F))

((Q))1_SCOE//Value of $B\left(\frac{3}{4},\frac{1}{4}\right)$ is

((A))2π

((B))$\pi\sqrt{2}$

((C))$\pi/2$

((D))$\sqrt{2}$

((E))B

((F))

((Q))1_SCOE//The value of $\int_0^\infty \frac{x^{m-1}-x^{n-1}}{(1+x)^{m+n}}dx$ is

((A))0

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

((C))$2B(m,n)$

((D))1

((E))A

((F))

((Q))1_SCOE//The value of $\int_0^\infty \frac{x^{m-1}+x^{n-1}}{(1+x)^{m+n}}dx$ is

((A))0

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

((C))$2B(m,n)$

((D))1

((E))C

((F))

((Q))2_SCOE//If $I(a)=\int_0^\infty \frac{e^{-x}}{x}(1-e^{-ax})dx \quad (a>-1)$ then the value of $\frac{dI(a)}{da}$ is

((A))$1/(a+1)$

((B))$-1/(a+1)$

((C))$\log(a+1)$
((D))0
((E))A
((F))

((Q))2_SCOE//The value of $\frac{d}{da}\left[\int_0^\infty \frac{e^{-x}}{x}\left(a-\frac{1}{x}+\frac{e^{-ax}}{x}\right)dx\right]$, where a is parameter, is
((A))$\int_0^\infty \frac{e^{-x}}{x}(1-e^{-ax})dx$
((B))$\int_0^\infty \frac{e^{-x}}{x}(1+e^{-ax})dx$
((C))$\int_0^\infty \frac{e^{-x}}{x}\left(1-\frac{e^{-ax}}{a}\right)dx$
((D))$\int_0^\infty \frac{e^{-x}}{x}\left(1+\frac{e^{-ax}}{a}\right)dx$
((E))A
((F))

((Q))2_SCOE//If $I(a)=\int_a^{a^2} e^{ax^2}dx$ then $\frac{dI(a)}{da}=$
((A))$\int_a^{a^2} x^2e^{ax^2}dx+e^{a^5}-e^{a^3}$
((B))$\int_a^{a^2} 2axe^{ax^2}dx+2ae^{a^5}-e^{a^3}$
((C))$\int_a^{a^2} x^2e^{ax^2}dx+2ae^{a^5}-e^{a^3}$
((D))$\int_a^{a^2} e^{ax^2}dx+e^{a^5}-2ae^{a^3}$
((E))C
((F))

((Q))2_SCOE//If $II(aa)=\int_0^\infty \frac{e^{-ax}-e^{-bx}}{x}dx$ and $I'(a)=-\frac{1}{a}$ then the value of $I(a)$ is
((A))$\log a$
((B))$\log(a/b)$
((C))$\log b$
((D))$\log(b/a)$
((E))D
((F))
((Q))2_SCOE//If $F(x)=\int_0^x (x-t)^2G(t)dt$ then $\frac{dF}{dx}$ is
((A))$\int_0^x -2(x-t)G(t)dt$
((B))$\int_0^x (x-t)G'(t)dt$
((C))$\int_0^x 2(x-t)G(t)dt$
((D))$\int_0^x (x-t)^2G'(t)dt$
((E))C
((F))

((Q))2_SCOE//If $\frac{dI}{da} = \frac{a}{a^2+1}$, then the value of integral $I(a) = \int_0^\infty \frac{e^{-x}-e^{-ax}}{x\sec x} dx$ is

((A))$\frac{1}{2}\log\left(\frac{a^2+1}{2}\right)$

((B))$\frac{1}{2}\log\left(\frac{a^2+1}{a}\right)$

((C))$\log(a^2+1)$

((D))$-\log(a^2+1)$

((E))A

((F))

((Q))2_SCOE//The value of the integral $I(a) = \int_0^{\pi/2} \frac{\log(1+\mathrm{a}\sin^2 x)}{\sin^2 x} dx$ with $\frac{dI}{da} = \frac{\pi}{2\sqrt{a+1}}$ is

((A))$\pi\sqrt{a+1}$

((B))$\pi[\sqrt{a+1}+1]$

((C))$(a+1)^{3/2}$

((D))$\pi[\sqrt{a+1}-1]$

((E))D

((F))

((Q))2_SCOE//The value of $\frac{d}{da}\left[\int_a^{a^2} \frac{dx}{x+a}\right]$ is

((A))$\int_a^{a^2} \frac{dx}{(x+a)^2} + \frac{2}{a+1} + \frac{1}{2a}$

((B))$\int_a^{a^2} -\frac{dx}{(x+a)^2} + \frac{2}{a^2+a} - \frac{1}{2a}$

((C))$\int_a^{a^2} -\frac{dx}{(x+a)^2} + \frac{2}{a+1} - \frac{1}{2a}$

((D))$\int_a^{a^2} -\frac{dx}{(x+a)^2} + \frac{2}{a^2+a}$

((E))C

((F))

((Q))2_SCOE//If $I(a) = \int_a^{a^2} \log(ax)\, dx$, then the value of $\frac{dI}{da}$ is

((A))$\int_a^{a^2} \frac{dx}{x} + 6a\log a - 2\log a$

((B))$\int_a^{a^2} \frac{dx}{x} + 2a\log a - \log a$

((C))$\int_a^{a^2} \frac{dx}{ax} + 6a\log a - 2\log a$

((D))$\int_a^{a^2} \frac{dx}{x} + 6a\log a$

((E))A

((F))

((Q))2_SCOE//If $I(a)=\int_0^\infty \frac{e^{-x}-e^{-ax}}{x\sec x}dx$ and $I'(a)=\frac{1}{2}\log(a^2+1)+c$ then the value of c is

((A))$\log\left(1/\sqrt{2}\right)$

((B))$2\log 2$

((C))$\log(\sqrt{2})$

((D))$-\log 4$

((E))A

((F))

((Q))2_SCOE//If $f(x)=\int_0^x (x-t)^2 G(t)\,dt$ then $\frac{d^3 f}{dx^3}$ is

((A))$G(x)$

((B))0

((C))$x^2 G(x)$

((D))$2G(x)$

((E))D

((F))

((Q))2_SCOE//If $I(a)=\int_0^\infty \frac{\tan^{-1}\left(\frac{x}{a}\right)-\tan^{-1}\left(\frac{x}{b}\right)}{x}dx$ and $I'(a)=-\frac{\pi}{2a}$ then $I(a)$ is

((A))$\frac{\pi}{2}\log\left(\frac{b}{a}\right)$

((B))$\frac{\pi}{2}\log\left(\frac{a}{b}\right)$

((C))$2\tan^{-1}a$

((D))$\tan^{-1}a-\tan^{-1}b$

((E))A

((F))

((Q))2_SCOE//If $\int_0^\pi \frac{dx}{a+b\cos x}=\frac{\pi}{a^2-b^2}$, $a>0, |b|<a$, then $\int_0^\pi \frac{\cos x dx}{(a+b\cos x)^2}$ is

((A))$\frac{\pi}{\sqrt{a^2-b^2}}$

((B))$\frac{\pi a}{(a^2-b^2)^{3/2}}$

((C))$\frac{-b}{(a^2-b^2)^{3/2}}$

((D))$\frac{-b\pi}{\sqrt{a^2-b^2}}$

((E))C

((F))

((Q))2_SCOE//If $\frac{d}{dt}\left[\mathrm{erf}(\sqrt{t})\right]=\frac{e^{-t}}{\sqrt{\pi t}}$, then the value of $\int_0^\infty e^{-t}\mathrm{erf}(\sqrt{t})\,dt$ is

((A))$\sqrt{2}$

((B))2

((C))$1/\sqrt{2}$

((D))$1/2$

((E))C

((F))

((Q))2_SCOE//If $\alpha(x) = \sqrt{\frac{2}{\pi}} \int_0^x e^{-t^2/2} dt$ then the value of $\alpha(x\sqrt{2})$ is

((A))$\mathrm{erf}(x\sqrt{2})$

((B))$-\mathrm{erf}(x)$

((C))$\mathrm{erf}(2x)$

((D))$\mathrm{erf}(x)$

((E))D

((F))

((Q))2_SCOE//The value of $\int_0^2 \mathrm{erf\,c}(x)\, dx + \int_0^2 \mathrm{erfc}(-x)\, dx$ is

((A))0

((B))4

((C))2

((D))-2

((E))B

((F))

((Q))2_SCOE//The value of $\int_0^t 2t\, \mathrm{erf}(t^2) dt + \int_0^t 2t\, \mathrm{erfc}(t^2)\, dt$ is

((A))0

((B))t

((C))1

((D))t^2

((E))D

((F))

((Q))2_SCOE//The value of the integral $\int_0^1 \left(\frac{x^a - 1}{logx}\right) dx$ is

((A))$loga$

((B))$\log(a+1)$

((C))$\log(a^2)$

((D))$\log(a-1)$

((E))B

((F))

((Q))2_SCOE// If $I\,(a) = \int_0^\infty \frac{e^{-x}}{x}(1 - e^{-ax})dx\,, then\;\; I'(a)\; is$

((A))$a+1$

((B))$-\left(\frac{1}{a+1}\right)$

((C))$\frac{1}{a+1}$

((D)) $-(a+1)$

((E))C

((F))

((Q))2_SCOE// $if\;\; I(a) = \int_0^\infty \left(\frac{cos\lambda x}{\lambda}\right)(e^{-ax} - e^{-bx})dx$ then the value of $I'(b)\;\; is$

((A))0

((B))$a+b$

((C))$\frac{1}{a+b}$

((D))$-\left(\frac{1}{a+b}\right)$

((E))A

((F))

((Q))2_SCOE// $If\ I(a) = \int_0^\infty \left(\frac{\tan^{-1}(ax)}{x(1+x^2)}\right) dx$ and $I'(a) = \frac{\pi}{2}\left(\frac{1}{a+1}\right)$ then the value of $I(a)\ is$

((A))$\log(a+1)$

((B))$\frac{\pi}{2}\log(a+1)$

((C))$\frac{\pi}{2}\left(\frac{1}{a+1}\right)$

((D))None of these.

((E))B

((F))

((Q))2_SCOE//$if\ \ I(a) = \int_0^\infty e^{-\left(x^2+\left(\frac{a^2}{x^2}\right)\right)} dx\ \ and\ \ I'(a) =$
$-2\,I(a)\ \ Thenthe\ value\ of\ the\ integral\ I(a)\ \ is$

((A))$\sqrt{\frac{\pi}{2}}\ e^{-2a}$

((B))$\frac{\pi}{2}e^{-2a}$

((C))$\frac{\pi}{2}\ e^{2a}$

((D))e^{-2a}

((E))A

((F))

((Q))2_SCOE//If $I(m) = \int_0^\infty e^{-ax}\left(\frac{\sin(mx)}{x}\right) dx = \tan^{-1}\left(\frac{m}{a}\right)$ then the value of the integral $\int_0^\infty \left(\frac{sinx}{x}\right) dx$ is

((A))$-\frac{\pi}{2}$

((B))0

((C))π

((D))$\frac{\pi}{2}$

((E))D

((F))

((Q))2_SCOE// $if\ I(a) = \int_0^\infty \frac{e^{-ax}-e^{-bx}}{x}\ dx\ \ \ and\ \ I'(a) = -\frac{1}{a}\ \ then\ the\ value\ of\ I(a)\ is$

((A)) $\log\left(\frac{a}{b}\right)$

((B))$\log\left(\frac{b}{a}\right)$

((C))$-loga$

((D))$\log b$

((E))B

((F))

((Q))2_SCOE//If $I'(a) = \frac{1}{a+1}\ then\ the\ value\ of\ I(a)\ is$

((A))$\log(a+1)+c$
((B))$\log(a+1)$
((C))$-\log(a+1)$
((D))None of these.
((E))A
((F))
((Q))2_SCOE//*if* $\int_0^\infty e^{-ax}\left(\frac{sinx}{x}\right)dx=\frac{\pi}{2}-\tan^{-1}\alpha$ *then value of* $\int_0^\infty\left(\frac{sinx}{x}\right)dx$ *is*
((A))$\frac{\pi}{4}$
((B))$tan^{-1}(\alpha)$
((C))$\frac{\pi}{2}$
((D))None of these.
((E))C
((F))
((Q))2_SCOE//*The value of integral* $\int_0^\infty\frac{1-cosax}{x^2}dx$ *is*
((A))$\frac{\pi}{2}$
((B))$-\frac{\pi}{2}$
((C))$\frac{\pi a}{2}$
((D))$-\frac{\pi a}{2}$
((E))C
((F))
((Q))2_SCOE// *If* $F(a)=\int_0^\infty\left(\frac{\log(1+ax^2)}{x^2}\right)dx=\pi\sqrt{a}\quad(a>0)$ *then* $F(1)$ *is*
((A))$\sqrt{\pi}$
((B))$\sqrt{a}$
((C))$-\sqrt{\pi}$
((D))π
((E))D
((F))
((Q))2_SCOE//The value of the integer $\int_0^5\mathrm{erf}_c(x)dx+\int_0^5\mathrm{erf}_c(-x)dx$ *is*
((A))5
((B))10
((C))2
((D))0
((E))B
((F))
((Q))2_SCOE//the value of $\frac{d}{da}[\mathrm{erf}(ax)+\mathrm{erf}_c(ax)]$ *is*
((A))1
((B))2
((C))∞
((D))0

((E))D

((F))

((Q))2_SCOE//If $\frac{d}{dx}\operatorname{erf}(\sqrt{x}) = e^{-x}/\sqrt{\pi x}$ then the value of integral $\int_0^\infty e^{-x} \operatorname{erf}(\sqrt{x})\, dx\ \ is$

((A))0

((B))$\sqrt{2}$

((C))$1/\sqrt{2}$

((D))$\frac{1}{2}$

((E))C

((F))

((Q))2_SCOE//The value of $\int_0^\infty e^{-(x+a)^2}\, dx \quad is$

((A))$\frac{\sqrt{\pi}}{2}\operatorname{erf}(a)$

((B))$\frac{\sqrt{\pi}}{2}\operatorname{erf}_c(a)$

((C))$\left(\frac{2}{\sqrt{\pi}}\right)\operatorname{erf}(a)$

((D))$\frac{2}{\sqrt{\pi}}\operatorname{erf}_c(a)$

((E))B

((F))

((Q))2_SCOE//The value of the integral $\int_0^\infty e^{-t^2}\, dt \quad is$

((A))$\frac{2}{\sqrt{\pi}}$

((B))$\frac{\sqrt{\pi}}{2}$

((C))$\frac{2}{\pi}$

((D))$\frac{\pi}{2}$

((E))B

((F))

((Q))2_SCOE//The value of the integral $\int_0^\infty e^{-x^2-2ax}\, dx$ is

((A))$\frac{2}{\sqrt{\pi}}e^{a^2}[1-\operatorname{erf}(a)]$

((B))$\frac{\sqrt{\pi}}{2}e^{a^2}[\operatorname{erf}(a)]$

((C))$\frac{\sqrt{\pi}}{2}e^{a^2}[1-\operatorname{erf}(a)]$

((D))None of these.

((E))C

((F))

((Q))2_SCOE//If $\int_0^\infty e^{-st}\operatorname{erf}(\sqrt{t})\, dt = \frac{1}{s\sqrt{s+1}}$ $\quad then \quad \int_0^\infty e^{-t}\operatorname{erf}(\sqrt{t})\, dt \quad is$

((A))1

((B))-1

((C))$\frac{1}{\sqrt{2}}$

((D))$-\frac{1}{\sqrt{2}}$

((E))C

((F))

((Q))2_SCOE//The curve $xy^2 = a^2(a - x)$ is symmetric about

((A))x −axis

((B))line $y = x$

((C))y −axis

((D))line $y = -x$

((E))A

((F))

((Q))2_SCOE//The curve represented by the equation $x^2y^2 = x^2 + 1$ is symmetrical about

((A)) $y = -x$

((B))both x and y axes

((C)) $x-$axis only

((D)) $y = x$

((E))B

((F))

((Q))2_SCOE//The curve represented by the equation $r^2\theta = a^2$ is symmetrical about

((A))pole

((B))line $\theta = \frac{\pi}{2}$

((C))Initial line $\theta = 0$

((D))line $\theta = \frac{\pi}{4}$

((E))A

((F))

((Q))2_SCOE//The equation of asymptotes parallel to y-axis to the curve represented by the equation $y^2(4-x)=x(x-2)^2$ is

((A))$x=2$

((B))$y=0$

((C))$x=4$

((D))$x=0$

((E))C

((F))

((Q))2_SCOE//The region of absence for the curve represented by the equation $xy^2=a^2(a-x)$ is

((A))$x>0$ and $x<a$

((B))$x<0$ and $x<a$

((C))$x<0$ and $x>a$

((D))$x>0$ and $x>a$

((E))C

((F))

((Q))2_SCOE//The region of absence for the curve represented by the equation $y^2=\frac{x^2(a-x)}{a+x}$ is

((A))$x>a$ and $x>-a$

((B))$x<a$ and $x<-a$

((C))$x<a$ and $x>-a$

((D))$x>a$ and $x<-a$

((E))D

((F))

((Q))2_SCOE//The equation of tangent to the curve at origin represented by the equation $y(1+x^2)=x$ is

((A))$y=x$

((B))$x=0$

((C))$x=\pm 1$

((D))$y=0$

((E))A
((F))

((Q))2_SCOE//The region of presence for the curve represented by the equation $y^2(6-x)=x^3$ is

((A))$x>6$

((B))$x<-6$

((C))$0<x<6$

((D))$x>6$ and $x<0$

((E))C
((F))

((Q))2_SCOE//The region of presence for the curve represented by the equation $y^2(x-a)=x^2(2a-x)$ is

((A))$x>a$

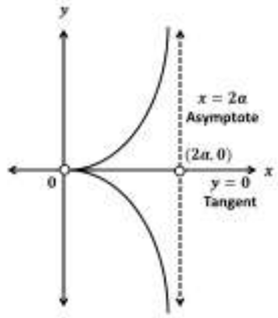
((B))$x<a$

((C))$0<x<a$

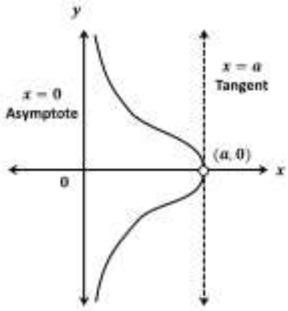
((D))$0<x<2a$

((E))D
((F))

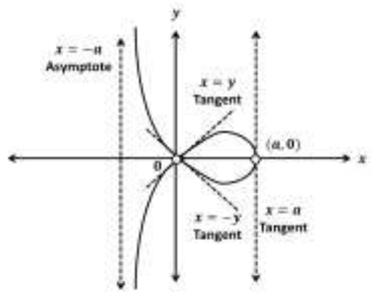
((Q))2_SCOE//The equation $y^2(2a - x) = x^3$ represents the curve



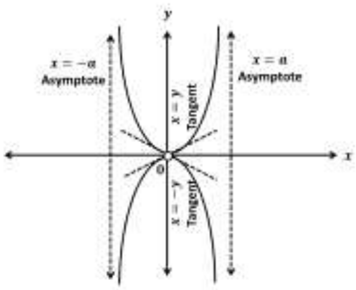
((A))



((B))



((C))

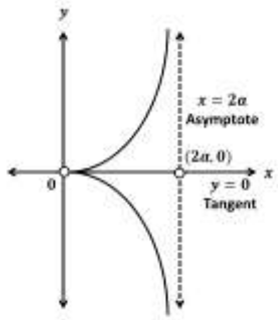


((D))

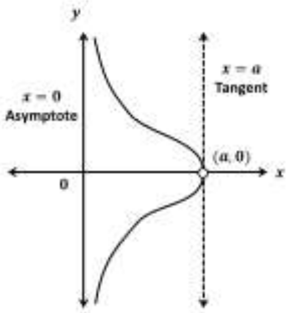
((E))A

((F))

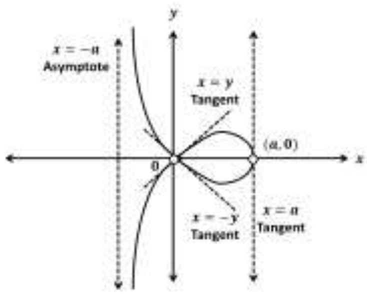
((Q))2_SCOE//The equation $x(x^2 + y^2) = a(x^2 - y^2)$ represents the curve



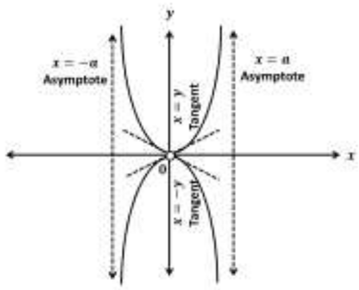
((A))



((B))



((C))

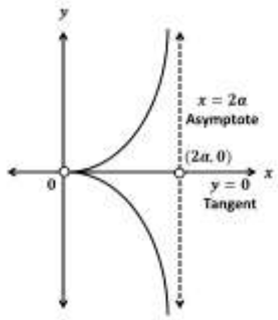


((D))

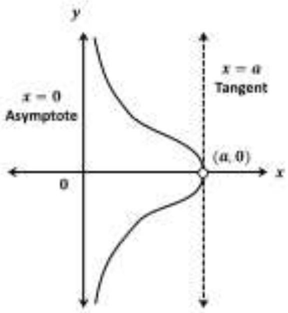
((E))C

((F))

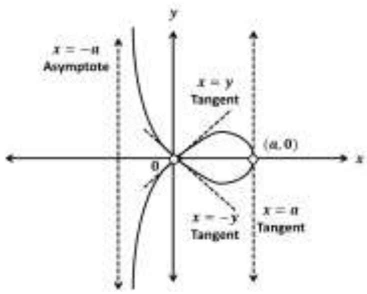
((Q))2_SCOE//The equation $xy^2 = a^2(a-x)$ represents the curve



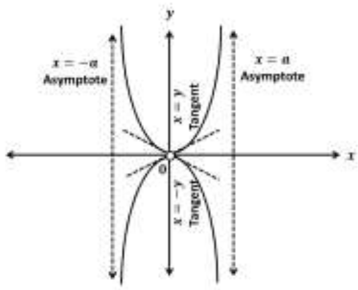
((A))



((B))



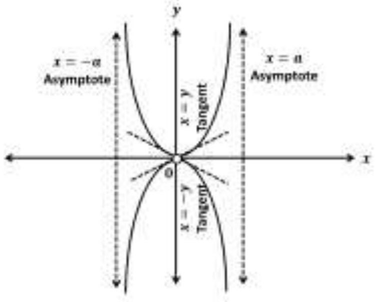
((C))



((D))

((E))B
((F))

((Q))2_SCOE//The equation of curve represented in the following figure is



((A))$xy^2 = a^2(a - x)$

((B))$y^2(2a - x) = x^3$

((C))$x(x^2 + y^2) = a(x^2 - y^2)$

((D))$x^2y^2 = a^2(y^2 - x^2)$

((E))D

((F))

((Q))2_SCOE//For n= 1 , the rose curve $r = asinn\theta \ or \ \ r = acosn\theta$ becomes

((A))Ellipse

((B))Parabola

((C))circle

((D))Hyperbola

((E))C

((F))

((Q))2_SCOE//For the rose curve $r = acosn\theta$ first loop is drawn along

((A))$\theta = 0$

((B))$\theta = \frac{\pi}{4}$

((C))$\theta = \frac{\pi}{2n}$

((D))$\theta = \pi$

((E))A

((F))

((Q))2_SCOE//The curve represented by the equation $xy^2 = 4a^2(a - x)$ have an asymptote

((A))Parallel to X axis

((B))Parallel to Y = X Line

((C))Y – Axis

((D))Does not exist

((E))C

((F))

((Q))2_SCOE// The curve represented by the equation $xy^2 = 4a^2(a - x)$ does exists in the range

((A))$0 \leq x \leq a$
((B))$x > a$
((C))$x < 0$
((D))$y = 0$
((E))A
((F))
((Q))2_SCOE//The equation of tangent represented by curve $a^2y^2 = x^2(a^2 - x^2)$ at the point (0,0) is
((A))$y = 0$
((B))$x = 0$
((C))$x = a$
((D))$y = \pm x$
((E))D
((F))
((Q))2_SCOE//For the rose curve $r = asinn\theta \quad or \quad r = acosn\theta$ if n is an odd then the curve consists of
((A))$(n-1) similar\ loops$
((B))$(n+1) similar\ loops$
((C))$2n\ similar\ loops$
((D)) $n\ similar\ loops$
((E))D
((F))
((Q))2_SCOE//The curve represented by the equation $y^2(2a - x) = x^3$ have an asymptote
((A))Parallel to X axis
((B))Parallel to Y = X line
((C))Y axis
((D))Does not exist
((E))C
((F))
((Q))2_SCOE//At origin (the point of intersection) the curve represented by the equation $xy^2 = 4a^2(a - x)$ have
((A))Node
((B))cusp
((C))asymptote
((D))conjugate point
((E))B
((F))
((Q))2_SCOE//The equation of tangent represented by curve $a^2y^2 = x^2(a^2 - x^2)$ at the point (0, 0) is
((A))$y = 0$
((B))$x = 0$
((C))$x = a$
((D))$y = \pm x$

((E))D
((F))
((Q))2_SCOE//The equation of asymptote of the curve $x^5 + y^5 - 5a^2x^2y = 0$ having $m = -1$ & $c = 0$ is
((A))$y = -1$
((B))$y = -x$
((C))$y = x$
((D))$x = 0$
((E))B
((F))
((Q))2_SCOE//If $tan\phi = \frac{1}{3}tan3\theta$ of the curve $r = 2sin3\theta$, then the tangents are parallel to radius vector at
((A))$\frac{\pi}{2}$
((B))$\theta = 0$
((C))$\theta = \frac{\pi}{6}$
((D))$\theta = \frac{\pi}{4}$
((E))B
((F))
((Q))2_SCOE//The tangent of the curve $x = t^2$, $y = t - \frac{t^3}{3}$ with $\frac{dy}{dx} = 0$ at $t = 1$ is
((A))Parallel to X axis
((B))Parallel to both X & Y axis
((C))Parallel to Y axis
((D))Parallel to Y = X Line
((E))A
((F))
((Q))2_SCOE//The curve represented by the equation

$$x = t^2, y = t - \frac{t^3}{3} \quad is$$

((A))Passes through origin
((B))does not passes through origin
((C))Symmetric about Y axis and passes through origin
((D))symmetric about Y axis and does not passes through origin
((E))A
((F))
((Q))2_SCOE//The curve represented by the equation $a(t + sint); y = a(1 - cost)$ is symmetric about
((A))X axis
((B))Y axis
((C))Both X and Y axis
((D))Y= X line
((E))B
((F))

((Q))2_SCOE//The curve represented by the equation $\sqrt{x}+\sqrt{y}=\sqrt{a}$ have an asymptote

((A))Does not exist

((B))Parallel to Y= X line

((C))Y Axis

((D))Parallel to X axis

((E))A

((F))

((Q))2_SCOE// The curve represented by the equation $\sqrt{x}+\sqrt{y}=\sqrt{a}$ is

((A))Symmetric about X axis and passes through origin

((B))Symmetric about the line Y = X & does not passes through origin

((C))Symmetric about Y axis and passes through origmmetric in

((D))Symmetric about Y axis and does not passes through origin.

((E))B

((F))

((Q))2_SCOE//The curve represented by the equation $y^2 = (x-1)(x-2)(x-3)$ is symmetric about

((A))X axis

((B))Y axis

((C))Both X and Y axis

((D))Y = X Line

((E))A

((F))

((Q))2_SCOE//The Tangent of the curve $\left(\frac{x}{a}\right)^{\frac{2}{3}}+\left(\frac{y}{b}\right)^{\frac{2}{3}}=1$ with

$$\frac{dy}{dx}= -\frac{b}{a} tant\ at\ t = \frac{\pi}{2}, \frac{3\pi}{2} \quad is$$

((A))Parallel to x axis

((B))Parallel to both X and Y axis

((C))Parallel to Y axis

((D))Parallel to Y = X Line

((E))C

((F))

((Q))2_SCOE//The length of arc of the curve $y = a\cosh(x/a)$, from vertex (0,0) to any point (x, y) using $1+\left(\frac{dy}{dx}\right)^2 = \cosh^2\frac{x}{a}$ is

((A))$a\cosh(x/a)$

((B))$\sinh(x/a)$

((C))$a\sinh(x/a)$

((D))$\cosh(x/a)$

((E))C

((F))

((Q))2_SCOE//The length of arc of upper part of loop of the curve $3y^2 = x(x-1)^2$from (0,0) to (1,0) using $1+\left(\frac{dy}{dx}\right)^2 = \frac{(3x+1)^2}{12x}$, is

((A))$4/\sqrt{3}$

((B))$1/\sqrt{3}$

((C))$\sqrt{3}$

((D))$2/\sqrt{3}$

((E))D

((F))

((Q))2_SCOE//The length of upper half of the cardioide$r = a(1+\cos\theta)$ where θ varies from 0 to π using $r^2 + \left(\frac{dr}{d\theta}\right)^2 = 2a^2(1+\cos\theta)$ is

((A))a

((B))$2a$

((C))$4a$

((D))$8a$

((E))C

((F))

((Q))2_SCOE//Integral for calculating the length of arc of parabola $y^2 = 4x$, cut off by the line $3y = 8$ is

((A))$\int_0^{16/9} \sqrt{1+\left(\frac{dy}{dx}\right)^2}\, dx$

((B))$\int_0^{9/16} \sqrt{1+\left(\frac{dy}{dx}\right)^2}\, dx$

((C))$\int_0^{8/3} \sqrt{1+\left(\frac{dy}{dx}\right)^2}\, dx$

((D))$\int_0^{3/8} \sqrt{1+\left(\frac{dy}{dx}\right)^2}\, dx$

((E))A

((F))

((Q))2_SCOE//The length of arc of the curve $x = e^{\theta}\cos\theta\,, y = e^{\theta}\sin\theta$, from $\theta = 0$ to $\theta = \pi/2$, using $\left(\frac{dx}{d\theta}\right)^2 + \left(\frac{dy}{d\theta}\right)^2 = 2e^{2\theta}$ is

((A))$\sqrt{2}e^{\pi/2}$

((B))$\sqrt{2}(e^{\frac{\pi}{2}} + 1)$

((C))$\sqrt{2}(e^{\frac{\pi}{2}} - 1)$

((D))$(e^{\frac{\pi}{2}} - 1)$

((E))C

((F))

((Q))2_SCOE//For the astroid$x^{2/3} + y^{2/3} = a^{2/3}$ the expression for $\left(\frac{dx}{d\theta}\right)^2 + \left(\frac{dy}{d\theta}\right)^2$ is

((A))$3a^2\sin^2\theta\cos^2\theta$

((B))$3a\sin^2\theta\cos^2\theta$

((C))$3\ a\sin\theta\cos\theta$

((D))$9a^2\sin^2\theta\cos^2\theta$

((E))D

((F))

((Q))2_SCOE//For the curve $ay^2 = x^3$, the expression for $1 + \left(\frac{dy}{dx}\right)^2$ is

((A))$9x/4a$

((B))$1 - (9x/4a)$

((C))$1 + (9x/4a)$

((D))$4a + 9x$

((E))C

((F))

((Q))2_SCOE//To find total length of the curve $9y^2 = (x + 7)(x + 4)^2$ the limits of the integration for x are

((A))$4\ to\ 7$

((B))$-4\ \ to\ 7$

((C))$-4\ \ to\ \ -7$

((D))$4\ \ to\ \ -7$

((E))C

((F))

((Q))2_SCOE//The total length of the loop of the curve $x = t^2,\ y = t\left(1 - \frac{t^2}{3}\right)$ if $ds^2 = (1 + t^2)^2$ and $0 < t < \sqrt{3}$ is

((A))4

((B))$4\sqrt{3}$

((C))$\sqrt{3}$
((D))$4+\sqrt{3}$
((E))B
((F))

((Q))2_SCOE//The limits of θ for finding the perimeter of $r = a(1+\cos\theta)$ are
((A))$0<\theta<\pi$
((B))$0<\theta<2\pi$
((C))$0<\theta<\pi/2$
((D))$0<\theta<\pi/4$
((E))B
((F))

((Q))2_SCOE//The arc length of the curve by using
$$\left(\frac{dy}{dx}\right)^2 = x^2-1 \ \ from\ x=0\ to\ x=2\ is$$
((A))3
((B))2
((C))4
((D))1
((E))B
((F))

((Q))2_SCOE//The arc length of the curve $y = logsecx\ from\ \ x=0\ to\ x=\frac{\pi}{3}$ is
((A))$s=\log(2+\sqrt{3})$
((B))$s=\log(\sqrt{2}+3\sqrt{3})$
((C))$s=\log(\sqrt{2}+\sqrt{3})$
((D))$s=\log(1+\sqrt{3})$
((E))D
((F))

((Q))2_SCOE//The arc length of the curve by using $1+\left(\frac{dy}{dx}\right)^2 = e^{4x}$ between $x=0\ \ to\ x=1\ \ is$
((A))e^4
((B))1
((C))$(e^2-1)/2$
((D))$\frac{e^2+1}{2}$
((E))C
((F))

((Q))2_SCOE//If the slope of the tangent of the curve at any point $(x,y)\ \ is\ (x-1), then\ the\ length\ of\ arc\ between\ x=1\ \&\ x=4\ \ is$
((A))$\frac{3}{2}\sqrt{10}-\frac{1}{2}(3+\sqrt{10})$
((B))3

((C))$\frac{1}{2}\sqrt{10}$
((D))$\frac{3}{2}\sqrt{10}+\frac{1}{2}(3+\sqrt{10})$
((E))D
((F))
((Q))2_SCOE//The arc length of the circle $x^2+y^2=a^2$ by using $1+\left(\frac{dy}{dx}\right)^2=\frac{a^2}{a^2-x^2}$from $x=0\ to\ x=a\ \ is$
((A))a
((B))$\frac{\pi}{a}$
((C))$\frac{\pi a}{2}$
((D))$\log(2a)$
((E))C
((F))
((Q))2_SCOE//The total length of the arc of circle $x^2+y^2=16$ by using $\sqrt{1+\left(\frac{dy}{dx}\right)^2}=\frac{4}{y}$is
((A))2π
((B))-2π
((C))π
((D))16π
((E))A
((F))
((Q))2_SCOE//The length of the arc of the curve $y^2=(2x-1)^3\ \ for$ $\frac{1}{2}\leq x\leq 4$ using $\sqrt{1+\left(\frac{dy}{dx}\right)^2}=\sqrt{18x-8}\ \ is$
((A))$\frac{511}{27}$
((B))$\frac{1022}{27}$
((C))$\frac{1122}{27}$
((D))$\frac{513}{27}$
((E))A
((F))
((Q))2_SCOE//The total length of the arc of the cardioder$r=a(1+cos\theta)$ using $r^2+\left(\frac{dr}{d\theta}\right)^2=4a^2\cos^2\frac{\theta}{2}$ is
((A))$16a$
((B))$2a$
((C))$8a$
((D))$4a$
((E))C
((F))
((Q))2_SCOE//The length of the loop of the curve $x=t^2\,,y=t\left(1-\frac{t^2}{3}\right)$ from $t=0\ to\ \sqrt{3}$ using $\left(\frac{dx}{dt}\right)^2+\left(\frac{dy}{dt}\right)^2=2(1+t^2)^2$ is

((A))$\sqrt{3}$
((B))$4\sqrt{2}$
((C))$4\sqrt{3}$
((D))$\sqrt{2}$
((E))C
((F))

((Q))2_SCOE//The length of the arc of the curve $x = e^{\theta}cos\theta$, $y = e^{\theta}sin\theta$ from $\theta = 0$ $to \frac{\pi}{2}$ $using$ $\left(\frac{dx}{d\theta}\right)^2 + \left(\frac{dy}{d\theta}\right)^2 = 2e^{2\theta}$ is
((A))$(e^{\frac{\pi}{2}} - 1)$
((B))$\sqrt{2}(e^{\frac{\pi}{2}} - 1)$
((C))logsinh2
((D))$\sqrt{2}(e^{\frac{\pi}{2}} + 1)$
((E))B
((F))

((Q))1_SCOE//If $I(\alpha) = \int_a^b f(x,\alpha)\,dx$, where α is parameter and a, b are constants then by DUIS rule, $\frac{dI(\alpha)}{d\alpha}$ is
((A))$\int_a^b \frac{\partial}{\partial\alpha} f(x,\alpha)dx$
((B))$\int_a^b \frac{\partial}{\partial x} f(x,\alpha)dx$
((C))$f(a,\alpha) - f(b,\alpha)$
((D))$f(x,\alpha)$
((E))A
((F))

((Q))1_SCOE//If $I(\alpha) = \int_a^b f(x,\alpha)\,dx$, where a, b are functions of parameter α, then by DUIS rule, $\frac{dI(\alpha)}{d\alpha}$ is
((A))$\int_a^b \frac{\partial}{\partial\alpha} f(x,\alpha)dx$
((B))$f(b,\alpha)\frac{db}{d\alpha} - f(a,\alpha)\frac{da}{d\alpha}$
((C))$\int_a^b \frac{\partial}{\partial\alpha} f(x,\alpha)dx + f(b,\alpha)\frac{db}{d\alpha} - f(a,\alpha)\frac{da}{d\alpha}$
((D))$\int_a^b \frac{\partial}{\partial\alpha} f(x,\alpha)dx + f(a,\alpha)\frac{da}{d\alpha} - f(b,\alpha)\frac{db}{d\alpha}$
((E))C
((F))

((Q))1_SCOE//If $I(a) = \int_0^\infty \frac{\cos\lambda x}{x}(e^{-ax} - e^{-bx})dx;\quad a > 0, b > 0$ then
((A))$\frac{dI(a)}{da} + \int_0^\infty e^{-ax}\cos\lambda x\,dx = 0$
((B))$\frac{dI(a)}{da} - \int_0^\infty e^{-ax}\cos\lambda x\,dx = 0$
((C))$\frac{dI(a)}{da} + \int_0^\infty e^{-ax}\sin\lambda x\,dx = 0$

((D))$\frac{dI(a)}{da} - \int_0^\infty e^{-ax} \sin \lambda x \, dx = 0$

((E))A

((F))

((Q))1_SCOE//The value of $\frac{d}{db}\left[\int_0^\infty \frac{e^{-ax}-e^{-bx}}{x} dx\right]$where $a > 0, b > 0$, is

((A))$\int_0^\infty \frac{be^{-bx}}{x} dx$

((B))$\int_0^\infty \frac{-be^{-bx}}{x} dx$

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

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

((E))D

((F))

((Q))1_SCOE//If $I(x) = \int_0^x f(t) \sin a(x-t) \, dt$, then $\frac{dI}{dx}$ is

((A))$\int_0^x f(t) \cos a(x-t) \, dt$

((B))$\int_0^x a\, f(t) \cos a(x-t) \, dt$

((C))$\int_0^x f'(t) \sin a(x-t) \, dt$

((D))$\int_0^x a\, f'(t) \sin a(x-t) \, dt$

((E))B

((F))

((Q))1_SCOE//If $I(a) = \int_0^{a^2} \tan^{-1}\left(\frac{x}{a}\right) dx$, then $\frac{dI}{da}$ is

((A))$\int_0^{a^2} \frac{\partial}{\partial a} \tan^{-1}\left(\frac{x}{a}\right) dx + 2a \tan^{-1} a$

((B))$\int_0^{a^2} \frac{\partial}{\partial a} \tan^{-1}\left(\frac{x}{a}\right) dx + a^2 \tan^{-1} a$

((C))$\int_0^{a^2} \frac{\partial}{\partial x} \tan^{-1}\left(\frac{x}{a}\right) dx + 2a \tan^{-1} a$

((D))$\int_0^{a^2} \frac{\partial}{\partial a} \tan^{-1}\left(\frac{x}{a}\right) dx + a \tan^{-1} a^2$

((E))A

((F))

((Q))1_SCOE//If $\int_0^\pi \frac{dx}{a+b\cos x} = \frac{\pi}{a^2-b^2}$, $a > 0, |b| < a$, then $\int_0^\pi \frac{dx}{(a+b\cos x)^2}$ is

((A))$\frac{\pi}{\sqrt{a^2-b^2}}$

((B))$\frac{\pi a}{(a^2-b^2)^{3/2}}$

((C))$\frac{\pi b}{(a^2-b^2)^{3/2}}$

((D))$\frac{-b\pi}{\sqrt{a^2-b^2}}$

((E))B

((F))

((Q))1_SCOE//The definition of erf($\sqrt{t}$) is

((A))$\frac{2}{\sqrt{\pi}} \int_0^t e^{-u^2} du$

((B))$\frac{2}{\sqrt{\pi}} \int_t^\infty e^{-u^2} du$

((C))$\frac{2}{\sqrt{\pi}}\int_0^{\sqrt{t}} e^{-u^2} du$

((D))$\frac{2}{\sqrt{\pi}}\int_{\sqrt{t}}^{\infty} e^{-u^2} du$

((E))C

((F))

((Q))1_SCOE//The value of erf(∞) is

((A))0

((B))1

((C))∞

((D))-1

((E))B

((F))

((Q))1_SCOE//The value of $erfc(x) + erfc(-x)$ is

((A))1

((B))2

((C))0

((D))-1

((E))B

((F))

((Q))1_SCOE//The value of $\int_0^t \mathrm{erf}(ax)\,dx + \int_0^t \mathrm{erfc}(ax)\,dx$ is

((A))1

((B))0

((C))$2t$

((D))t

((E))D

((F))

((Q))1_SCOE//The value of erf($-\infty$) is

((A))0

((B))1

((C))∞

((D))-1

((E))D

((F))

((Q))1_SCOE//Error function is

((A))Even function

((B))Neither ever nor odd function

((C))Odd function

((D))Constant function

((E))A
((F))
((Q))1_SCOE//The value of $erfc(0)$ is
((A))0
((B))1
((C))-1
((D))∞
((E))B
((F))

((Q))1_SCOE//The value of $\frac{d}{dx}\operatorname{erf}(x)$ is
((A))$\frac{2}{\sqrt{\pi}}e^{-tx^2}$
((B))$\frac{2}{\sqrt{\pi}}e^{x^2}$
((C))0
((D))$\frac{2}{\sqrt{\pi}}e^{-2x}$
((E))A
((F))

((Q))1_SCOE//The value of $\operatorname{erf}(b)-\operatorname{erf}(a)$ is
((A))$\frac{2}{\sqrt{\pi}}\int_a^b e^{-t^2}dt$
((B))$\int_a^b e^{-t^2}dt$
((C))$\frac{2}{\sqrt{\pi}}\int_a^b e^{t^2}dt$
((D))$\frac{2}{\sqrt{\pi\pi}}\int_b^a e^{-tt^2}dt\,dt$
((E))A
((F))

((Q))1_SCOE//The value of $\operatorname{erf}(b)-\operatorname{erf}(a)$ is
((A))$\frac{1}{\sqrt{\pi}}\int_a^b e^{-t^2}\,dt$
((B))$2\int_a^b e^{-t^2}\,dt$
((C))$\int_a^b e^{-t^2}\,dt$
((D))$\frac{2}{\sqrt{\pi}}\int_a^b e^{-t^2}\,dt$
((E))D
((F))

((Q))1_SCOE//The value of $erferfcc(\infty)$ is
((A))0

((B))1

((C))-1

((D))∞

((E))A

((F))

((Q))1_SCOE//The value of $erfcerfc(-\infty)$ is

((A))0

((B))1

((C))-1

((D))2

((E))D

((F))

((Q))1_SCOE//The value of $erf(\infty) + erfc(-\infty)$ is

((A))3

((B))2

((C))1

((D))0

((E))A

((F))

((Q))1_SCOE//The value of $erfc(x) + erfc(-x)$ is

((A))3

((B))2

((C))1

((D))0

((E))B

((F))

((Q))1_SCOE//A point through which two branches of curve passes is called

((A))Double point

((B))Cusp

((C))Node

((D))Isolated point

((E))A

((F))

((Q))1_SCOE//A double point is Node if

((A))Distinct branches have a common tangent

((B))Distinct branches have distinct tangent

((C))Tangent at double point is above the curve

((D))Tangent at double point is below the curve

((E))B
((F))

((Q))1_SCOE//A double point is Cusp if

((A))Two branches have distinct tangents

((B))Tangent line cuts the curve unusually

((C))Two branches have a common tangent

((D))None of the above

((E))C
((F))

((Q))1_SCOE//If all powers of y are even in the equation then curve is symmetrical about

((A))y −axis

((B))line$y = x$

((C))x −axis

((D))line$y = -x$

((E))C
((F))

((Q))1_SCOE//If the equation of curve remains unchanged by replacing y by $-y$, then the curve is symmetric about

((A))y −axis

((B))line$y = x$

((C))x −axis

((D))line$y = -x$

((E))C
((F))

((Q))1_SCOE//If all terms of x are of even degree in the equation of curve, then the curve is symmetric about

((A))y −axis

((B))line$y = x$

((C))x −axis

((D))line$y = -x$

((E))A
((F))

((Q))1_SCOE//If the equation of curve remains unchanged by replacing x by $-x$, then the curve is symmetric about

((A))y −axis

((B))line$y = x$

((C))x −axis

((D))line$y = -x$

((E))A
((F))

((Q))1_SCOE//If the equation of curve remains unchanged by replacing x by $-y$ and y by $-x$, then the curve is symmetric about

((A))y −axis

((B))line$y = x$

((C))x −axis

((D))line$y = -x$

((E))D
((F))

((Q))1_SCOE//If the equation of curve does not contains any absolute constant term then the curve

((A))Passes through origin

((B))Is increasing

((C))Does not pass through origin

((D))Is decreasing

((E))A
((F))

((Q))1_SCOE//If the curve passes through origin then the tangent to the curve at origin is obtained by

((A))Equating highest degree terms to zero

((B))Equating odd degree terms to zero

((C))Equating even degree terms to zero

((D))Equating lowest degree terms to zero

((E))D
((F))

((Q))1_SCOE//The curve decreases strictly in the given interval if in that interval

((A))$\frac{dy}{dx} < 0$

((B))$\frac{dy}{dx} > 0$

((C))$\frac{dy}{dx} = 0$

((D))None of the above

((E))A
((F))

((Q))1_SCOE//Asymptotes are the tangents to the curve

((A))At origin parallel to y −axis

((B))At origin not parallel to co-ordinate axis

((C))At origin parallel to x −axis

((D))At infinity and are of the form $y = mx + c$

((E))D
((F))

((Q))1_SCOE//Asymptotes parallel to x −axis are obtained by equating

((A))Coefficient of highest degree terms of y in the equation to zero

((B))Lowest degree terms to zero

((C))Highest degree terms to zero

((D))Coefficient of highest degree terms of x in the equation to zero

((E))D
((F))

((Q))1_SCOE//The parametric curve $x = f(t), y = g(t)$ is symmetric about x −axis if

((A))$f(t)$ is even and $g(t)$ is an odd function of t

((B))Both $f(t)$ and $g(t)$ are odd function of t

((C))$f(t)$ is an odd and $g(t)$ is even function of t

((D))Both $f(t)$ and $g(t)$ are even functions of t

((E))A
((F))

((Q))1_SCOE//The curve $xy^2 = a^2(a - x)$

((A))passes through the point $(-a, 0)$

((B))does not pass through origin

((C))passes through the origin

((D))passes through the point (a, a)

((E))B
((F))

((Q))1_SCOE//In cartesian equation the points where $\frac{dy}{dx} = 0$, tangent to the curve at those points will be

((A))parallel to $y-$axis

((B))parallel to $y = x$

((C))parallel to $x-$axis

((D))parallel to $y = -x$

((E))C
((F))

((Q))1_SCOE//If the polar equation to the curve remains unchanged by changing θ to $-\theta$ then curve is symmetrical about

((A))line $\theta = \frac{\pi}{4}$

((B))line $\theta = \frac{\pi}{2}$

((C))pole

((D))initial line $\theta = 0$

((E))D
((F))

((Q))1_SCOE//If the polar equation to the curve remains unchanged by changing θ to $\pi - \theta$ then curve is symmetrical about

((A))initial line $\theta = 0$

((B))line passing through pole and perpendicular to initial line

((C))pole

((D))line $\theta = \frac{\pi}{4}$

((E))B
((F))

((Q))1_SCOE//For the rose curve $r = a\cos n\theta$ and $r = a\sin n\theta$ if n is odd then the curve consist of

((A)) $2n$ equal loops

((B)) $(n-1)$ equal loops

((C)) $(n+1)$ equal loops

((D)) n equal loops

((E))D
((F))

((Q))1_SCOE//For the polar curve, angle ϕ between radius vector and tangent line is obtained by the formula

((A)) $\cot\phi = r\dfrac{d\theta}{dr}$

((B)) $\tan\phi = r\dfrac{dr}{d\theta}$

((C)) $\tan\phi = r\dfrac{d\theta}{dr}$

((D)) $\sin\phi = r\dfrac{d\theta}{dr}$

((E))C
((F))

((Q))1_SCOE//The curve represented by the equation $x = at^2,\ y = 2at$ is symmetrical about

((A)) $y-$axis

((B))both x and y axes

((C)) $x-$axis

((D))opposite quadrants

((E))C
((F))
((Q))1_SCOE//The formula to find the length of the curve $y = f(x)$ from $x = a$ to $x = b$ is $s =$

((A)) $\int_a^b \sqrt{1 + \left(\frac{dy}{dx}\right)^2}\, dx$

((B)) $\int_a^b \sqrt{1 + \left(\frac{dy}{dx}\right)^2}\, dy$

((C)) $\int_a^b \sqrt{a^2 + \left(\frac{dy}{dx}\right)^2}\, dx$

((D)) $\int_a^b \sqrt{a^2 + b^2\left(\frac{dy}{dx}\right)^2}\, dy$

((E))A

((F))

((Q))1_SCOE//The formula to find the length of the curve $x = f(y)$ from $y = a$ to $y = b$ is $S =$

((A)) $\int_a^b \sqrt{1 + \left(\frac{dx}{dy}\right)^2}\, dx$

((B)) $\int_a^b \sqrt{1 + \left(\frac{dx}{dy}\right)^2}\, dy$

((C)) $\int_a^b \sqrt{a^2 + \left(\frac{dx}{dy}\right)^2}\, dx$

((D)) $\int_a^b \sqrt{a^2 + b^2\left(\frac{dx}{dy}\right)^2}\, dy$

((E))B

((F))

((Q))1_SCOE//The formula to find the length of the curve $x = f(t),\ y = g(t)$ from $t = t_1$ to $t = t_2$ is

((A)) $\int_{t_1}^{t_2} \sqrt{\frac{dx}{dt} + \frac{dy}{dt}}\, dt$

((B)) $\int_{t_1}^{t_2} \sqrt{\left(\frac{dx}{dt}\right)^2 + \left(\frac{dy}{dt}\right)^2}\, dt$

((C)) $\int_{t_2}^{t_1} \sqrt{\left(\frac{dx}{dt}\right)^2 + \left(\frac{dy}{dt}\right)^2}\, dt$

((D)) $\int_{t_1}^{t_2} \sqrt{\left(\frac{dx}{dt}\right)^2 + \left(\frac{dy}{dt}\right)^2}\, dx$

((E))B

((F))

((Q))1_SCOE//The formula to find the length of the curve $r = f(\theta)$ from $\theta = \theta_1$ to $\theta = \theta_2$ is

((A)) $\int_{\theta_1}^{\theta_2} \sqrt{1 + \left(\frac{dr}{d\theta}\right)^2}\, d\theta$

((B)) $\int_{\theta_1}^{\theta_2} \sqrt{r^2 + \left(\frac{dr}{d\theta}\right)^2}\, d\theta$

((C)) $\int_{\theta_1}^{\theta_2} \sqrt{r^2 + \left(\frac{dr}{d\theta}\right)^2}\, dr$

((D)) $\int_{\theta_2}^{\theta_1} \sqrt{r^2 + \left(\frac{dr}{d\theta}\right)^2}\, d\theta$

((E))B

((F))

((Q))1_SCOE//The formula to find the length of the curve $\theta = f(r)$ from $r = r_1$ to $r = r_2$ is

((A))$\int_{r_1}^{r_2} \sqrt{r^2 + \left(\frac{d\theta}{dr}\right)^2}\ dr$

((B))$\int_{r_1}^{r_2} \sqrt{r^2 + \left(\frac{d\theta}{dr}\right)^2}\ d\theta$

((C))$\int_{r_1}^{r_2} \sqrt{1 + r^2\left(\frac{d\theta}{dr}\right)^2}\ dr$

((D))$\int_{r_2}^{r_1} \sqrt{r^2 + \left(\frac{d\theta}{dr}\right)^2}\ d\theta$

((E))C

((F))