# MATHS

# BOOKS - HIMALAYA MATHS (KANNADA ENGLISH)

# DIFFERENTIAL EQUATIONS

## Question Bank

**1.** The ordr of the differential equation $\left(\frac{d^2y}{dx^2}\right)^3 = \left(1+\frac{dy}{dx}\right)^{\frac{1}{2}}$ is

A. 6

B. 3

C. 44228

D. 2

**Answer: D**

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**2.** The degree of the differential equation $\frac{d^2y}{dx^2} + 3\left(\frac{dy}{dx}\right)^2 = x^2 \log\left(\frac{d^2y}{dx^2}\right)$ is

A. 1

B. 2

C. 3

D. none of these

**Answer: B**

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**3.** 1

A. $p < q$

B. p=q

C. p/q = 1/2

D. $p > q$

**Answer: B**

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**4.** The degree of the differential equation of which $y^2 = 4a(x + a)$ is a solution is

A. 1

B. 2

C. 3

D. 4

**Answer: A**


**5.** The differential equation obtained by eliminating the parameter m from $y= mx + a/m$ is of degree

A. 2

B. 1

C. 3

D. none

**Answer: B**

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**6.** The differential equation representing the family of curves $y^2 = 2c\left(x + \sqrt{c}\right)$ , where $c > 0$ , is a parameter is of order and degree as follows :

A. order 1, degree 3

B. order 2, degree 2

C. degree 3, order 3

D. degree 4, order 4

**Answer: A**

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**7.** The differential equation of the family of lines passing through the origin is

A. $x\,dy/dx + y = 0$

B. $x+dy/dx =0$

C. $dy/dx =y$

D. $x\,dy/dx-y =0$

**Answer: D**

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**8.** The differential equation of all non-horizontal lines in a plane is

A. $\frac{d^2y}{dx^2} = 0$

B. dx/dy = 0

C. dy/dx = 0

D. $\frac{d^2x}{dy^2} = 0$

**Answer: D**

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**9.** The differential equation which represents the family of plane curves $y = e^{cx}$ is

A. dy/dx = cy

B. x dy/dx- log y = 0

C. x log y = y dy/dx

D. y log y = x dy/dx

**Answer: A**

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**10.** The differential equation of all circles passing through the origin and having their centres on the x - axis is :

A. $y^2 = x^2 + 2xy\frac{dy}{dx}$

B. $y^2 = x^2 - 2xy\frac{dy}{dx}$

C. $y^2 = x^2 + xy\frac{dy}{dx}$

D. none of these

**Answer: A**

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**11.** The differential equation of the family of concentric circles with centre at the origin is

A. $x + y\,dy/dx = 0$

B. $x = y\,dy/dx$

C. $dy/dx = y/x$

D. none of these

**Answer: A**

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**12.** The differential equation of family of parabolas with foci at the origin and axis is y=0.

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

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

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

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

**Answer: A**

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**13.** The differential equation of the family of parabolas having their vertices at the origin and foci on x-axis is

A. $y = 2x\, dy/dx$

B. $x = 2y\, dy/dx$

C. $xy = dy/dx$

D. none of these

**Answer: A**

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**14.** The differential equation of the family of parabolas having their vertex at the origin and focus on y-axis is

A. $x \, dy/dx = 2y$

B. $y \, dy/dx = x$

C. $xy \, dy/dx = c$

D. $2x \, dy/dx = y$

**Answer: A**

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**15.** The differential equation of all unit circles having their centres on the y-axis is

A. $\frac{dy}{dx} = \frac{x^2}{1-x^2}$

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

C. $\frac{dy}{dx} = \frac{x}{\sqrt{1-x^2}}$

D. $\left(\frac{dy}{dx}\right)^2 = \frac{x}{1-x^2}$

**Answer: B**

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16. $y = \sqrt{e^{2\log_e x}}$ satisfies the equation

A. dy/dx = x

B. dy/dx =1

C. dy/dx = -x

D. dy/dx = -1

**Answer: B**

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**17.** The solution of the equation $e^{\frac{dy}{dx}} = x + 3$ is given by

A. y = (x+3) log (x+3)-x+c

B. y = (x+3) log (x+3)+x+c

C. y = (x-3) log (x+3)+x+c

D. y = (x-3) log (x+3)-x+c

**Answer: A**

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**18.** $\tan^{-1} x + \tan^{-1} y = c$ is the general solution of the differential equation

A. $\frac{dy}{dx} = \frac{1+y^2}{1+x^2}$

B. $\frac{dy}{dx} = \frac{1+x^2}{1+y^2}$

C. `(1+x^(2)) dy + (1+y^(2)) dx = 0

D. $\frac{dy}{dx} = \frac{1-y^2}{1-x^2}$

**Answer: C**

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**19.** The general solution of $ydx - xdy - 3x^2y^2e^{x^3}dx = 0$ is

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

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

C. $xy = e^{x^3} + c$

D. $xy = e^{x} + c$

**Answer: A**

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**20.** Solution of the differential equation xdy-ydx =0 represents

A. a rectangular hyperbola

B. line passing through the origin

C. Parabola whose vertex is at the origin

D. circle whose centre is at origin

**Answer: B**

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**21.** The solution of the differential equation 2x dy/dx-y=3 represent

A. lines

B. circles

C. parabola

D. ellipses

**Answer: C**

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**22.** The general solution of $\frac{dy}{dx} + \sqrt{\frac{1-y^2}{1-x^2}} = 0$ is

A. $\sin^{-1} x . \sin^{-1} y = c$

B. $\sin^{-1} x = c . \sin^{-1} y$

C. $\sin^{-1} x - \sin^{-1} y = c$

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

**Answer: D**

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**23.** The solution of $\frac{dy}{dx} = x . e^{x-y}$ is

A. $e^{x-y} = c$

B. $e^y(xe^x + e^x) + c + 1 = 0$

C. $e^{x-y} = e^{xy}$

D. $e^y = e^x(x-1) + c$

**Answer: D**

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**24.** The general solution of $\frac{dy}{dx} = \frac{ax+h}{by+k}$ represents a parabola when

A. a = 0, b = 0

B. a = 1, b = 2

C. $a = 0, b \neq 0$

D. a = 2, b = 1

**Answer: C**

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**25.** The solution of the differential equation $y \sec^2 x dx + \tan x . \sec^2 y dy = 0$ is

A. tanx +tan y = k

B. tanx - tan y = k

C. $(\tan x)/(\tan y) = k$

D. $\tan x . \tan y = k$

**Answer: D**

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**26.** Solution of the differential equation $dy/dx + y/x = \sin x$ is

A. $x( y + \cos x) = \sin x + c$

B. $x(y - \cos x) = \sin x + c$

C. $x(y \cos x) = \sin x + c$

D. x(y+cos x) = cos x + c

**Answer: A**

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**27.** The solution of the differential equation $x\sqrt{1-y^2}dx + y\sqrt{1-x^2}dy = 0$

A. $x\sqrt{1-x^2} + y\sqrt{1-y^2} = c$

B. $x\sqrt{1-y^2} + y\sqrt{1+x^2} = c$

C. $x\sqrt{1-y^2} + y\sqrt{1-x^2} = c$

D. $\sqrt{1-y^2} + \sqrt{1-x^2} = c$

**Answer: D**

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**28.** Solution of dy/dx + 2xy=y is

A. $y = c.\ e^{x - x^2}$

B. $y = c.\ e^{x^2} - x$

C. $y = c.\ e^{x}$

D. $y = c.\ e^{x^2} + x$

**Answer: A**

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**29.** The solution of the differential equation cosx siny dx + sin x cos y dy = 0 is

A. (sin x)/(sin y) = c

B. cos x+ cos y = c

C. sin x + sin y = c

D. sin x. sin y = c

**Answer: D**

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**30.** A curve passes through the point (5,3) and at any point (x,y) on it, the product of its slope and the ordinate is equal to its abscissa. The curve is

A. parabola

B. ellipse

C. hyperbola

D. circle

**Answer: C**

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**31.** A curve passes through the point (2a,a) and at any point the sum of cartesian subtangent and the abscissa is equal to the constant a. The equation of the curve is

A. $y(x-a)=a^2$

B. y(x+a) = a^(2)

C. $x(y-a)=a^2$

D. $x(y-a)=a^2$

**Answer: A**

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**32.** If $2f(x) = f'(x)$ and f(0) = 3, then f(2) =

A. $4e^3$

B. $3e^4$

C. $2e^3$

D. $3e^2$

**Answer: B**

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**33.** The equation of a curve passing through $(2, 7/2)$ and having gradient $1 - \frac{1}{x^2}at(x, y)$ is

A. $y = x^2 + x + 1$

B. $xy = x^2 + x + 1$

C. xy = x+1

D. $xy = x^2 + 1$

**Answer: B**

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**34.** The differential equation of the family of hyperbolas with asymptotes as the lines x+y=1 and x-y =1 is

A. $yy' + x = 1$

B. $yy' = x - 1$

C. $yy' + y' = 0$

D. $y' + xy = 0$

**Answer: B**

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**35.** A solution of dy/dx = (x+y)/x is

A. y = x(log x +c)

B. x = y(log y + c)

C. y = log x +c

D. x = log y + c

**Answer: A**

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**36.** Solution of $\frac{dy}{dx} = \frac{y}{x+y}$ is

A. $y = ke^{\frac{y}{x}}$

B. $y = ke^{\frac{x}{y}}$

C. $x = k.\, e^{\frac{y}{x}}$

D. $x = ke^{\frac{x}{y}}$

**Answer: B**

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**37.** Solution of dy/dx = (x+Y)/(x-y) is

A. $\left(\tan^{-1}\right)\frac{x}{y} - \frac{1}{2}\log\left(x^2 + y^2\right) = c$

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

C. $\left(\tan^{-1}\right)\frac{y}{x}-\frac{1}{2}\log\left(x^2+y^2\right)=c$

D. $\left(\tan^{-1}\right)\frac{y}{x}-\frac{1}{2}\log\left(x^2+y^2\right)+c$

**Answer: C**

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**38.** A population grows at the rate of 5% per year. How long does it take for the population to double.

A. 10. log 2 years

B. 20. log 2 years

C. 30. log 2 years

D. 40.log 2 years

**Answer: B**

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**39.** In a bank, principle p increases continuously at the rate of 5% per year. Find the principal in terms of time t.

A. 10 log 3

B. 10 log 2

C. $20 \log_e 2$

D. $20 \log_e 3$

**Answer: C**

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**40.** The rate of increase of bacteria in a culture proportional to the number of bacteria present and it found that the number doubles in 5 hours. Calculate how many times the bacteria my be expected to grow at the end of 15 hours

A. 6 times

B. 7 times

C. 8 times

D. 9 times

**Answer: C**

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**41.** The degree of the differential equation $\left(\frac{d^2y}{dx^2}\right)^3 + \left(\frac{dy}{dx}\right)^2 + \sin\left(\frac{dy}{dx}\right) + 1 = 0$ is

A. 3

B. 2

C. 1

D. not defined

**Answer: D**

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**42.** The order of the differential equation $2x^2\frac{d^2y}{dx^2} - 3\frac{dy}{dx} + y = 0$ is

A. 2

B. 1

C. 0

D. not defined

**Answer: A**

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**43.** The number of arbitary constants in the general solution of a differential equation of fourth order are :

A. 0

B. 2

C. 3

D. 4

**Answer: D**

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**44.** The number of arbitary constants in the particular solution of a differential equation of third order are :

A. 3

B. 2

C. 1

D. 0

**Answer: D**

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**45.** Which of the following differential equations has y=x as one of its particular solution

A. $\frac{d^2y}{dx^2} - x^2\frac{dy}{dx} + xy = x$

B. $\frac{d^2y}{dx^2} + x\frac{dy}{dx} + xy = x$

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

D. $\frac{d^2y}{dx^2} + x\frac{dy}{dx} + xy = 0$

**Answer: C**

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**46.** Which of the following differential equations has $y = c_1 e^x + c_2 e^{-x}$ as the general solution?

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

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

C. $\frac{d^2y}{dx^2} + 1 = 0$

D. $\frac{d^2y}{dx^2} - 1 = 0$

**Answer: B**

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**47.** The general solution of the differential equation $\frac{dy}{dx} = e^{x+y}$ is

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

B. $e^x + e^y = c$

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

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

**Answer: A**

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**48.** A homogeneous differential equation of the from $\frac{dx}{dy} = h\left(\frac{x}{y}\right)$ can be solved by making the substitution.

A. $y = \nu x$

B. $\nu = yx$

C. $x = \nu y$

D. $x = \nu$

**Answer: C**

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**49.** Which of the following is a homogeneous differential equation?

A. (4x+6y+5)dy-(3y+2x+4)dx = 0

B. $xydx - \left(x^3 + y^3\right)dy = 0$

C. $\left(x^3 + 2Y^2\right)dx + 2xydy = 0$

D. `(y^(2) dx + (x^(2)-xy - y^(2)) dy)= 0

**Answer: D**

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**50.** The integrating factor of the differential equation $x\frac{dy}{dx} - y = 2x^2$ is

A. $e^{-x}$

B. $e^{-y}$

C. 1/x

D. x

**Answer: C**

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**51.** The Integrating Factor of the differential equation $(1-y^2)\frac{dx}{dy} - yx = ay(-1 < y < 1)$ is

A. $\frac{1}{y^2-1}$

B. $\frac{1}{\sqrt{y^2-1}}$

C. $\frac{1}{1-y^2}$

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

**Answer: D**

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**52.** The general solution of the differential equation (ydx-xdy)/y =0 is

A. xy = c

B. $x = cy^2$

C. y =cx

D. $y = cx^2$

**Answer: C**

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**53.** The general solution of a differential equation of the type $\frac{dx}{dy} + P_1 x = Q_1$ is

A. $y.\, e^{\int p_1 dy} = \int \left( Q_1 e^{\int p_1 dy} \right) dy + c$

B. $y.\, e^{\int p_1 dx} = \int \left( Q_1 e^{\int p_1 dx} \right) dx + c$

C. $x.\, e^{\int p_1 dy} = \int \left( Q_1 e^{\int p_1 dy} \right) dy + c$

D. $x.\, e^{\int p_1 dx} = \int \left( Q_1 e^{\int p_1 dx} \right) dx + c$

**Answer: C**

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**54.** The general solution of the differential equation $e^x dy + (ye^x + 2x)dx = 0$ is

A. $xe^y + x^2 = c$

B. $xe^y + y^2 = c$

C. $ye^x + x^2 = c$

D. $ye^y + x^2 = c$

**Answer: C**

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**55.** The degree of the differential equation $\left(1+\frac{dy}{dx}\right)^3=\left(\frac{d^2y}{dx^2}\right)^2$ is

A. 1

B. 2

C. 3

D. 4

**Answer: B**

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**56.** The degree of the differential equation $\frac{d^2y}{dx^2} + 3\left(\frac{dy}{dx}\right)^2 = x^2 \log\left(\frac{d^2y}{dx^2}\right)$ is

A. 1

B. 2

C. 3

D. not defined

**Answer: D**

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**57.** The order and the degree of the equation $\left[1+\left(\frac{dy}{dx}\right)^2\right]=\frac{d^2y}{dx^2}$

A. 1,2

B. 2,2

C. 2,1

D. 4,2

**Answer: C**

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**58.** The order of differential equation of all circles of given radius "a" is _____

A. 1

B. 2

C. 3

D. 4

**Answer: B**

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**59.** The solution of the differential equation 2x dy/dx-y=3 represent

A. straight lines

B. circles

C. parabolas

D. ellipses

**Answer: C**

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**60.** The integrating factor of the differential equation :

$\frac{dy}{dx}(x \log x) + y = 2 \log x$ is :

A. $e^x$

B. log x

C. log(log x)

D. x

**Answer: B**

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**61.** Which of the following functions is a solution of the differential equation $\left(\frac{dy}{dx}\right)^2 - x\left(\frac{dy}{dx}\right) + y = 0$ ?

A. y =2

B. y = 2x

C. y = 2x -4

D. $y = 2x^2 - 4$

**Answer: C**

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**62.** Which of the following is not a homogeneous function of x and y

A. $x^2 + 2xy$

B. 2x-y

C. $\cos^2\left(\frac{y}{x}\right) + \frac{y}{x}$

D. sinx - cos y

**Answer: D**

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**63.** Solution of the differential equation $\frac{dx}{x} + \frac{dy}{y} = 0$ is

A. 1/x+1/y =c

B. log x. log y = c

C. xy = c

D. x + y = c

**Answer: C**

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**64.** Find the general solution of the differential equation $x\frac{dy}{dx} + 2y = x^2(x \neq 0)$

A. $y = \frac{x^2 + c}{4x^2}$

B. $y = \frac{x^2}{4} + c$

C. $y = \frac{x^4 + c}{x^2}$

D. $y = \frac{x^4 + c}{4x^2}$

**Answer: D**

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**65.** The degree of the differential equation $\left(\frac{d^2y}{dx^2}\right)^2 + \left(\frac{dy}{dx}\right)^2 = x\sin\left(\frac{dy}{dx}\right)$ is

A. 1

B. 2

C. 3

D. not defined

**Answer: D**

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**66.** The degree of the equation $\left[1+\left(\frac{dy}{dx}\right)^2\right]^{\frac{3}{2}}=\left(\frac{d^2y}{dx^2}\right)$ is

A. 4

B. 44230

C. not defined

D. 2

**Answer: D**

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**67.** The order and degree of the differential equation $\frac{d^2y}{dx^2} + \left(\frac{dy}{dx}\right)^{\frac{1}{4}} + x^{\frac{1}{5}} = 0$ is

A. 2 and not defined

B. 2 and 2

C. 2 and 3

D. 3 and 3

**Answer: A**

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**68.** If $y = e^{-x}(A\cos x + B\sin x)$, then y satisfies :

A. $\frac{d^2y}{dx^2} + 2\frac{dy}{dx} = 0$

B. $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + 2y = 0$

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

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

**Answer: C**

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**69.** The differential equation for $y = A\cos\alpha x + B\sin\alpha x$ Where A and B are arbitary constants is

A. $\frac{d^2y}{dx^2} - \alpha^2 y = 0$

B. $\frac{d^2y}{dx^2} + \alpha^2 y = 0$

C. $\frac{d^2y}{dx^2} + \alpha y = 0$

D. $\frac{d^2y}{dx^2} - \alpha y = 0$

**Answer: B**

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**70.** Solution of the differential equation xdy-ydx =0 represents

A. a rectangular hyperbola

B. parabola whose vertex is origin

C. straight line passing through origin

D. a circle whose centre is at origin

**Answer: C**

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**71.** Integrating factor of the differential equation $\cos x \, dy/dx + y \sin x = 1$ is

A. $\cos x$

B. $\tan x$

C. $\sec x$

D. $\sin x$

**Answer: C**

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**72.** The solution of the differential equation $y\sec^2 x dx + \tan x . \sec^2 y dy = 0$ is

A. tan x + tan y = k

B. tan x - tan y = k

C. (tan x)/(tan y) = k

D. tan x. tan y = k

**Answer: D**

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**73.** The family $y = ax + a^3$ of curves is represented by the differential equation of degree :

A. 1

B. 2

C. 3

D. 4

**Answer: C**

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**74.** Integrating factor of $x\frac{dy}{dx} - y = x^4 - 3x$ is

A. x

B. log x

C. 1/x

D. minus x

**Answer: C**

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**75.** Solution of dy/dx-y =1, y(0) =1 is given by

A. $xy = -e^{-y}$

B. $xy = -e^{-x}$

C. xy = -1

D. $y = 2e^{x} - 1$

**Answer: D**

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**76.** The number of solutions of dy/dx = (y+1)/(x-1) when y(1) = 2 is

A. none

B. one

C. two

D. infinite

**Answer: B**

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**77.** Which of the following is a second order differential equation?

A. $\left(y'\right)^2 + x = y^2$

B. $y'y'' + y = \sin x$

C. $y''' + (y'')^2 + y = 0$

D. $y' = Y^2$

**Answer: B**

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**78.** Integrating factor of the differential equation $(1 - x^2)\frac{dy}{dx} - xy = 1$ is

A. minus x

B. $\frac{x}{1 + x^2}$

C. $\sqrt{1 - x^2}$

D. $\frac{1}{2}\log(1-x^2)$

**Answer: C**

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**79.** $\tan^{-1}x+\tan^{-1}y=c$ is the general solution of the differential equation

A. $\frac{dy}{dx}=\frac{1+y^2}{1+x^2}$

B. $\frac{dy}{dx}=\frac{1+x^2}{1+y^2}$

C. $(1+x^2)dy+(1+y^2)dx=0$

D. $(1+x^2)dx+(1+y^2)dy=0$

**Answer: C**

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**80.** The differential equation $y\frac{dy}{dx} + x = c$ represents

A. family of hyperbolas

B. family of parabolas

C. family of ellipse

D. family of circles

**Answer: D**

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**81.** The general solution of $e^x \cos y dx - e^x \sin y dy = 0$ is :

A. $e^x \cos y = k$

B. $e^x \sin y = k$

C. $e^x = k \cos y$

D. $e^x = k \sin y$

**Answer: A**

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**82.** The degree of the differential equation $\frac{d^2y}{dx^2} + \left(\frac{dy}{dx}\right)^3 + 6y^5 = 0$ is

A. 1

B. 2

C. 3

D. 5

**Answer: A**

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**83.** The solution of $\frac{dy}{dx} + y = e^{-x}, y(0) = 0$ is :

A. $y = e^{x}(x - 1)$

B. $y = xe^{-x}$

C. $y = xe^{-x} + 1$

D. $y = (x + 1)e^{-x}$

**Answer: B**

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**84.** Find the general solution of the differential equation $\frac{dy}{dx} = \frac{1+y^2}{1+x^2}$.

A. $y = \tan^{-1} x$

B. y-x = k(1+xy)

C. $x = \tan^{-1} y$

D. tan(xy) = k

**Answer: B**

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**85.** The integrating factor of $\frac{dy}{dx} + y = \frac{1+y}{x}$ is

A. $\frac{x}{e^x}$

B. $\frac{e^x}{x}$

C. $xe^x$

D. $e^x$

**Answer: B**

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**86.** $y = ae^{mx} + be^{-mx}$ satisfies which of the following differential equations?

A. dy/dx+my = 0

B. dy/dx-my =0

C. $\frac{d^2y}{dx^2} - m^2y = 0$

D. $\frac{d^2y}{dx^2} + m^2y = 0$

**Answer: C**

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**87.** The solution of the differential equation cosx siny dx + sin x cos y dy = 0 is

A. (sin x)/(sin y) = c

B. sin x sin y = c

C. sin x + sin y = c

D. cos x cos y = c

**Answer: B**

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**88.** The solution of $x\frac{dy}{dx} + y = e^x$ is

A. $y = \frac{e^x}{x} + \frac{k}{x}$

B. $y = xe^x + cx$

C. y = xe + k

D. $x = \frac{e^y}{y} + \frac{k}{y}$

**Answer: A**

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**89.** The differential equation for the family of curves $x^2 + y^2 - 2ay = 0$, where a is an arbitrary constant , is :

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

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

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

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

**Answer: A**

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**90.** Family $y = Ax + A^3$ of curves will correspond to a differential equation of order :

A. 3

B. 2

C. 1

D. not defined

**Answer: C**

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**91.** The general solution of $\frac{dy}{dx} = 2xe^{x^2 - y}$ is

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

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

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

D. $e^{x^2+y}+c$

**Answer: C**

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**92.** The curve for which the slope of the tangent at any point equals the ratio of the abscissa to the ordinate of the point is :

A. an ellipse

B. a parabola

C. a circle

D. a rectangular hyperbola

**Answer: D**

Watch Video Solution

**93.** The general solution of the differential equation $\frac{dy}{dx} = e^{\frac{x^2}{2}} + xy$ is

A. $y = ce^{-\frac{x^2}{2}}$

B. $y = ce^{\frac{x^2}{2}}$

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

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

**Answer: C**

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**94.** The solution of the equation (2y-1) dx- (2x+3)dy =0 is

A. (2x-1)/(2y+3) = k

B. (2y+1)/(2x-3) = k

C. (2x+3)/(2y-1) = k

D. (2x-1)/(2y-1) = k

**Answer: C**

 Watch Video Solution

**95.** The differential equation for which y = a cos x + b sin x is

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

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

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

D. `(d^(2)y)/dx^(2) + (a-b)y = 0

**Answer: A**

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**96.** The order and the degree of the equation $\left[1+\left(\frac{dy}{dx}\right)^2\right]=\frac{d^2y}{dx^2}$

A. 2,2/3

B. 2,3

C. 2,1

D. 3,4

**Answer: C**

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**97.** Which of the following is the general solution of $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + y = 0$?

A. $y = (Ax + B)e^x$

B. $y = (Ax + B)e^{-x}$

C. $y = Ae^x + Be^{-x}$

D. y = A cos x + B sin x

**Answer: A**

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**98.** The differential equation of the family of curves $y^2 = 4a(x + a)$ is

A. `y^(2) = 4 dy/dx (x+dy/dx)

B. $2y\frac{dy}{dx} = 4a$

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

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

**Answer: D**

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**99.** General solution of $\frac{dy}{dx} + y\tan x = \sec x$ is :

A. y sec x = tan x + c

B. y tan x = sec x +c

C. tan x = y tan x + c

D. x sec x = tan y + c

**Answer: A**

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**100.** Solution of the differential equation dy/dx +y/x = sin x is

A. x( y+ cos x) = sin x + c

B. x(y- cos x) = sin x + c

C. xy cos x = sin x + c

D. x(y+cos x) = cos x + c

**Answer: A**

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**101.** The general solution of the differential equation $(e^x + 1)ydy = (y + 1)e^x dx$ is

A. $(y + 1) = k(e^x + 1)$

B. $(y + 1) = e^x + 1 + k$

C. $y = \log\{k(y + 1)(e^x + 1)\}$

D. $y = \log\left\{\frac{e^x + 1}{y + 1}\right\} + k$

**Answer: C**

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**102.** The solution of the differential equation $\frac{dy}{dx} = e^{x-y} + x^2 e^{-y}$ is

A. `y = e^(x-y) - x^(2)e^(-y)+c

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

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

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

**Answer: B**

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**103.** The solution of the differential equation $\frac{dy}{dx} + \frac{2x}{1+x^2}y = \frac{1}{(1+x^2)^2}$ is

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

B. $\frac{y}{1+x^2} = c + \tan^{-1} x$

C. $y\log(1+x^2) = c + \tan^{-1} x$

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

**Answer: A**

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**104.** The solution of the differential equation cosy.

cos x dx + sin x . Sin y dy = 0 is

A. sin x = c cos y

B. cos x = c. sin y

C. tan x = c

D. sec x - sec y = c

**Answer: A**

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**105.** The degree of the differential equation

$$\frac{d^2y}{dx^2} + \left[1 + \left(\frac{dy}{dx}\right)^2\right]^{\frac{3}{2}} = 0$$

A. 1

B. 2

C. 3

D. 4

**Answer: B**

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**106.** 19. The elimination of A and B from the equation $y^2 = Ax + B$ gives differential equation of order

A. second

B. first

C. zero

D. third

**Answer: A**

Watch Video Solution

**107.** The solution of the differential equation $y\sec^2 x dx + \tan x . \sec^2 y dy = 0$ is

A. tan x. tan y = k

B. tan x + tan y = k

C. tan x - tan y = k

D. (tan x)/(tan y) = k

**Answer: A**

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**108.** If m and n are order and degree of the differential equation $\left(\frac{d^2y}{dx^2}\right)^5 + \frac{\left(\frac{d^2y}{dx^2}\right)^3}{\left(\frac{d^3y}{dx^3}\right)} + \frac{d^3y}{dx^3} = x^2 - 1$ then

A. m = 3, n = 1

B. m = 3, n = 3

C. m = 3, n =2

D. m = 3, n = 5

**Answer: C**

Watch Video Solution

**109.** The solution of $\frac{dy}{dx} = 2^{y-x}$ is

A. $2^y + 2^x = k$

B. $2^x - 2.\ 2^y = k$

C. $\frac{1}{2^x} - \frac{1}{2^y} = k$

D. $\frac{1}{2^x} + \frac{1}{2^y} = k$

**Answer: C**

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**110.** The differential equation obtained by eliminating A and B from $y = A\cos\omega t + B\sin\omega t$ is

A. $Y'' + y' = 0$

B. $y'' - \omega^2 y = 0$

C. $y'' = -\omega^2 y$

D. $y'' + y = 0$

**Answer: C**

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**111.** The order and degree of the differential equation $x\frac{d^2y}{dx^2} + \left(\frac{dy}{dx}\right)^2 + y^2 = 0$ are respectively

A. 1 and 2

B. 2 and 1

C. 1 and 1

D. 2 and 2

**Answer: B**

Watch Video Solution

**112.** $y = ae^{mx} + be^{-mx}$ satisfies which of the following differential equations?

A. dy/dx - my = 0

B. dy/dx + my = 0

C. $\frac{d^2y}{dx^2} + m^2y = 0$

D. $\frac{d^2y}{dx^2} - m^2y = 0$

**Answer: D**

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**113.** Which of the following functions is a solution of the differential equation $\left(\frac{dy}{dx}\right)^2 - x\left(\frac{dy}{dx}\right) + y = 0$ ?

A. $y = 2x^2 - 4$

B. $y = 2x - 4$

C. y = 2x

D. y =2

**Answer: B**

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**114.** The solution for the differential equation $\frac{dy}{y} + \frac{dx}{x} = 0$ is

A. log x . log y = c

B. 1/x + 1/y = c

C. x+y = c

D. xy = c

**Answer: D**

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**115.** The differential equation for which $\sin^{-1} x + \sin^{-1} y = C$ is given by

A. $\sqrt{1-x^2}dy - \sqrt{1-y^2}dx = 0$

B. $\sqrt{1-x^2}dx - \sqrt{1-y^2}dy = 0$

C. $\sqrt{1-x^2}dx + \sqrt{1-y^2}dy = 0$

D. $\sqrt{1-x^2}dy + \sqrt{1-y^2}dx = 0$

**Answer: A**

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**116.** The general solution of the differential equation $dy/dx + (1+ \cos 2y)/(1- \cos 2x) = 0$ is given by

A. $\tan y + \cot x = c$

B. $\tan y - \cot x = c$

C. $\tan x - \cot y = c$

D. $\tan x + \cot y = c$

**Answer: B**

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**117.** The degree of the differential Equation

$$\left(1+\left(\frac{dy}{dx}\right)^2\right)^{3/4}=\left(\frac{d^2y}{dx^2}\right)^{1/3}$$

A. 44256

B. 4

C. 9

D. 44289

**Answer: B**

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**118.** Form the differential equation of the family of circles touching the y- axis at origin.

A. $x^2 - y^2 - 2xy\frac{dy}{dx} = 0$

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

C. $x^2 + y^2 - 2xy\frac{dy}{dx} = 0$

D. $x^2 + y^2 + 2xy\frac{dy}{dx} = 0$

**Answer: B**

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**119.** The general solution of the differential equation

$(2x - y + 1)dx + (2y - x + 1)dy = 0$ is...

A. $x^2 - y^2 + 2xy - x + y = c$

B. $x^2 - y^2 - 2xy + x - y = c$

C. $x^2 + y^2 + xy - x + y = c$

D. $x^2 + y^2 - xy + x + y = c$

**Answer: D**

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**120.** The solution of the differential equation

$e^{-x}(y+1)dy + \left(\cos^2 x - \sin 2x\right)y(dx) = 0$

subjected to the condition that y = 1 when x = 0 is

A. $\log(y+1) + e^x \cos^x = 1$

B. $y + \log y + e^x \cos^2 x = 2$

C. $(y+1) + e^x \cos^x = 2$

D. $y + \log y = e^x \cos^x$

**Answer: B**

Watch Video Solution

**121.** The general solution of the differential equation $(e^x + 1)ydy = (y + 1)e^x dx$ is

A. $(y + 1) = k(e^x + 1)$

B. $y + 1 = e^x + 1 + k$

C. $y = \log(k(y + 1))(e^x + 1)$

D. $y = \log\left(\frac{e^x + 1}{y + 1}\right) + k$

**Answer: C**

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**122.** The differential equation of the family of straight lines whose slope is equal to y - intercept is

A. $(x+1)\,dy/dx + y = 0$

B. $(x+1)\,dy/dx - y = 0$

C. $dy/dx = (x-1)/(y+1)$

D. $dy/dx - (x-1)/(y-1)$

**Answer: B**

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**123.** The order and degree of the differential equation $\left[1+\left(\frac{dy}{dx}\right)^5\right]^{\frac{1}{3}}=\frac{d^2y}{dx^2}$ are respectively

A. 2,1

B. 1,5

C. 2,3

D. 2,5

**Answer: C**

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**124.** A particular solution of $\frac{dy}{dx} = (x + 9y)^2$ when x=0, y = 1/27 is

A. $3x + 27y = \tan 3\left(x + \frac{\pi}{12}\right)$

B. $3x + 27y = \tan^{-1} 3\left(x + \frac{\pi}{12}\right)$

C. $3x + 27y = \tan 9\left(x + \frac{\pi}{12}\right)$

D. $3x + 27y = \tan\left(x + \frac{\pi}{12}\right)$

**Answer: A**

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**125.** The order and degree of the differential equation $\left(1+3\frac{dy}{dx}\right)^{2/3}=4\frac{d^3y}{dx^3}$ are :

A. (1, 2/3)

B. (3,4)

C. (3,3)

D. (1,2)

**Answer: C**

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**126.** The differential equation of all non - vertical lines in a plane is :

A. $\frac{d^2y}{dx^2} = 0$

B. dx/dy = 0

C. dy/dx = 0

D. $\frac{d^2x}{dy^2} = 0$

**Answer: A**

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**127.** The solution of the equation $\frac{d^2y}{dx^2} = e^{-2x}$ is :

A. $\frac{e^{-2x}}{4}$

B. $\frac{e^{-2x}}{4} + cx + d$

C. $\frac{1}{4}e^{-2x} + cx^2 + d$

D. $\frac{1}{4}e^{-2x} + c + d$

**Answer: B**

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**128.** The degree and order of the differential equation of the family of all parabolas whose axis is x - axis, are respectively :

A. 2,1

B. 1,2

C. 3,2

D. 2,3

**Answer: B**

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**129.** The solution of the differential equation :

$ydx + \left(x + x^2y\right)dy = 0$ is :

A. 1/xy + log y = c

B. 1/xy + log y = c

C. 1/xy = c

D. log y = cx

**Answer: B**

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**130.** The differential equation for the family of curves $x^2 + y^2 - 2ay = 0$, where a is an arbitrary constant , is :

A. $\left(x^2 - y^2\right)y' = 2xy$

B. $2\left(x^2 + y^2\right)y' = xy$

C. $2\left(x^2 - y^2\right)y' = xy$

D. $\left(x^2 + y^2\right)y' = 2xy$

**Answer: A**

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**131.** The differential equation representing the family of curves $y^2 = 2c\left(x + \sqrt{c}\right)$ , where $c > 0$ , is a parameter is of order and degree as follows :

A. order 1, degree 3

B. order 2, degree 3

C. order 3, degree 3

D. degree 4, order 4

**Answer: A**

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**132.** If

$y = y(x)$ and $\frac{2+\sin x}{y+1}\left(\frac{dy}{dx}\right) = -\cos x, y(0) = 1$

then $y\left(\frac{\pi}{2}\right)$ equals :

A. 44230

B. 44232

C. 44256

D. 1

**Answer: C**

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**133.** The solution of $2xy\frac{dy}{dx} = 1 + y^2$ is

A. $1 - y^2 = cx$

B. $1 + y^2 = cx$

C. $1 - x^2 = cy$

D. $1 + x^2 = cy$

**Answer: B**

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**134.** If c is a parameter, then the differential equation whose solution is $y = c^2 + \frac{c}{x}$ is

A. $y = x^4\left(\frac{dy}{dx}\right) - x\left(\frac{dy}{dx}\right)^2$

B. $y = x^4\left(\frac{dy}{dx}\right)^2 + x\left(\frac{dy}{dx}\right)$

C. $y = x^4\left(\frac{dy}{dx}\right)^2 - x\left(\frac{dy}{dx}\right)$

D. $y = x^4\left(\frac{d^2y}{dx^2}\right) - x\left(\frac{dy}{dx}\right)$

**Answer: C**

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**135.** Solution of $x^2 + y^2\frac{dy}{dx} = 4$ is

A. $x^2 + y^2 = 12x + c$

B. $x^2 + y^2 = 3x + c$

C. $x^3 + y^3 = 3x + c$

D. $x^3 + y^3 = 12x + c$

**Answer: D**

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**136.** The family of curves in which the subtangent at any point to any curve is double the abscissa is given by

A. $x = cy^2$

B. $y = cx^2$

C. $x^2 = cy^2$

D. y = cx

**Answer: A**

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**137.** The solution of $xdx + ydy = x^2ydy - xy^2dx$ is

A. $x^2 - 1 = c(1 + y^2)$

B. $x^2 + 1 = c(1 - y^2)$

C. $x^3 - 1 = c(1 + y^3)$

D. $x^3 + 1 = c(1 - y^3)$

**Answer: A**

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**138.** The solution of dy/dx = $\left(\frac{y}{x}\right)^{\frac{1}{3}}$ is

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

B. $x^{\frac{1}{3}} + y^{\frac{1}{3}} = c$

C. $y^{\frac{2}{3}} - x^{\frac{2}{3}} = c$

D. $y^{\frac{1}{3}} - x^{\frac{1}{3}} = c$

**Answer: C**

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**139.** Order of the differential equation of the family of all concentric circles centred at (h,k) is

A. 1

B. 2

C. 3

D. 4

**Answer: A**

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**140.** Solution of $\frac{dy}{dx} = \frac{x\log x^2 + x}{\sin y + y\cos y}$ is

A. $y.\ \sin y = x^2 \log x + c$

B. $y.\ \sin y = x^2 + c$

C. $y.\ \sin y = x^2 + \log x + c$

D. y . Sin y = x log x + c

**Answer: A**

View Text Solution

**141.**

$dx + dy = (x + y)(dx - dy) \Rightarrow \log(x + y) =$

A. x+y+c

B. x+2y+c

C. x-y+c

D. 2x+y+c

**Answer: C**

View Text Solution

**142.** The equation of a curve passing through the origin and satisfying the differential equation $\frac{dy}{dx} = (x - y)^2$ is

A. $e^{2x}(1 - x + y) = (1 + x - y)$

B. $e^{2x}(1 + x - y) = (1 - x + y)$

C. $e^{2x}(1 - x + y) = (1 + x - y) = 0$

D. $e^{2x}(1 + x + y) = 1 - x + y$

**Answer: A**

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**143.** The general solution of $e^x \cos y dx - e^x \sin y dy = 0$ is :

A. $e^x(\sin y + \cos y) = c$

B. $e^x \sin y = c$

C. $e^x = c \cos y$

D. $e^x . \cos y = c$

**Answer: D**

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**144.** The differential equation $y\frac{dy}{dx} + x = c$ represents

A. a family of hyperbolas

B. a family of circles whose centres are on y-axis

C. a family of ellipse

D. a family of circles whose centres are on x-axis

**Answer: D**

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**145.** The general solution of $ydx - xdy - 3x^2y^2e^{x^3}dx = 0$ is

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

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

C. $xy = e^{x^3} + c$

D. $xye^{x^3} + c$

**Answer: A**

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**146.** $\tan^{-1} x + \tan^{-1} y = c$ is the general solution of the differential equation

A. $\frac{dy}{dx} = \frac{1+y^2}{1+x^2}$

B. $\frac{dy}{dx} = \frac{1+x^2}{1+y^2}$

C. `(1+x^(2)) dy + (1+y^(2)) dx = 0

D. dy/dx = (1-y^(2)/(1-x^(2))

**Answer: C**

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**147.** The differential equation of the family of lines passing through the origin is

A. $x\,dy/dx + y = 0$

B. $x + dy/dx = 0$

C. $dy/dx = y$

D. $x\,dy/dx - y = 0$

**Answer: D**

View Text Solution

**148.** The degree of the differential equation $\frac{d^2y}{dx^2} + \left(\frac{dy}{dx}\right)^3 + 6y = 0$ is

A. 1

B. 3

C. 2

D. 5

**Answer: A**

View Text Solution

**149.** The solution of the equation (2y-1) dx- (2x+3)dy =0 is

A. (2x-1)/(2y+3) = c

B. (2x+3)/(2y-1) = c

C. (2x-1)/(2y-1) = c

D. (2y+1)/(2x-3) = c

**Answer: B**

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**150.** The solution of the differential equation cosx siny dx + sin x cos y dy = 0 is

A. (sin x)/(sin y) = c

B. cos x + cos y = c

C. sin x + sin y = c

D. sinx . Sin y = c

**Answer: D**

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**151.** Find the general solution of the differential equation $\frac{dy}{dx} = \frac{1+y^2}{1+x^2}$.

A. $y = \tan^{-1} x$

B. y-x = C(1+xy)

C. $x = \tan^{-1} y$

D. tan (xy) = C

**Answer: B**

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**152.** The differential equation of the family of curves $y^2 = 4a(x + a)$ is

A. $y^2 = 4\dfrac{dy}{dx}\left(x + \dfrac{dy}{dx}\right)$

B. $y^2\left(\dfrac{dy}{dx}\right)^2 + 2xy\dfrac{dy}{dx} - y^2 = 0$

C. $2y\dfrac{dy}{dx} = 4a$

D. $y^2\dfrac{dy}{dx} + 4y = 0$

**Answer: B**

View Text Solution

**153.** Solution of dy/dx + 2xy=y is

A. $y = c.\ e^{x - x^2}$

B. $y = c.\ e^{x^2} - x$

C. $y = ce^{x}$

D. $y = c.\ e^{-x^2}$

**Answer: A**

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**154.** The solution of the differential equation $x\sqrt{1-y^2}dx + y\sqrt{1-x^2}dy = 0$

A. V = x+2y

B. V = 2x+y

C. V = x+y

D. none of these

**Answer: A**

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**155.** The solution of log (dy/dx) = ax + by is

A. $\frac{e^{by}}{b} = \frac{e^{ax}}{a} + c$

B. $\frac{e^{-by}}{-b} = \frac{e^{ax}}{a} + c$

C. $\frac{e^{-by}}{a} = \frac{e^{ax}}{b} + c$

D. none of these

**Answer: B**

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**156.** Solution of differential equation (sin x + cos x)dy + ( cos x - sin x)dx = 0 is

A. $e^x(\sin x + \cos x) + c = 0$

B. $e^y(\sin x + \cos x) = c$

C. $e^y(\cos x - \sin x) = c$

D. $e^x(\sin x - \cos x + x) = c$

**Answer: B**

View Text Solution

**157.** Equation of the curve whose slope is $\frac{y-1}{x^2+x}$ and which passes through the point (1,0) is

A. xy+x+y-1=0

B. xy-x-y-1=0

C. (y-1)(x+1) = 2x

D. y(x+1)-x+1 =0

**Answer: A**

View Text Solution

**158.** $x \quad dy = y \quad dx + y^2$ and $y(1) = 1$ , then y (-3) is equal to :

A. 3

B. 2

C. 1

D. 0

**Answer: A**

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**159.** The differential equation $y\frac{dy}{dx} + x = c$ represents

A. a family of circles whose centres are on the y-axis

B. a family of hyperbola

C. a family of circles whose centres are an the x-axis

D. a family of parabolas

**Answer: C**

Watch Video Solution

**160.** The differential equation of the family of circles passing through the origin and having their centres on the x-axis is

A. $x^2 = y^2 + xy\frac{dy}{dx}$

B. $x^2 = Y^2 +_3 xy\frac{dy}{dx}$

C. $y^2 = x^2 + 2xy\frac{dy}{dx}$

D. $y^2 = x^2 - 2xy\frac{dy}{dx}$

**Answer: C**

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**161.** A population grows at the rate of 10% of the population per year. How logn does it take for the population to double?

A. 5 (log2) years

B. 2(log 10) years

C. 20(log 20 years

D. 10(log 2) years

**Answer: D**

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**162.** The order and degree of the differential equation $y = \frac{dp}{dx}x + \sqrt{a^2p^2 + b^2}$ where $p = \frac{a}{b}$ (here a and b are arbitrary constants) respectively are

A. 2,1

B. 1,2

C. 1,1

D. 2,2

**Answer: D**

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**163.** The solution of the differential equation 2x dy/dx-y=3 represent

A. circles

B. straight lines

C. parabolas

D. hyperbolas

**Answer: C**

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**164.** If m and n are degree and other of $\left(1+y_1^2\right)^{2/3}=y_2$, then tha value of $\frac{m+n}{m-n}$ is

A. 3

B. 4

C. 5

D. 12

**Answer: C**

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**165.** The differential equation of the family of lines passing through the origin is

A. $x = y\,dy/dx$

B. $x+y\,dy/dx = 0$

C. $dy/dx = y$

D. $y = x\,dy/dx$

**Answer: D**

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**166.** The particular solution of $\frac{y}{x}\frac{dy}{dx} = \frac{1+y^2}{1+x^2}$ when x=1 y=2 is

A. $5(1+y^2) = 2(1+x^2)$

B. $2(1+y^2) = 5(1+x^2)$

C. $5(1+y^2) = (1+x^2)$

D. $(1+y^2) = 2(1+x^2)$

**Answer: B**

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**167.** The solution of the differential equation $\frac{dy}{dx} = (x+y)^2$ is

A. 1/(x+y) = c

B. $\sin^{x+y} = x + c$

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

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

**Answer: D**

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**168.** Let $y' = e^{-2y}$ and y = 0 when x = e. Then the value of x when y = 1/2 is

A. e-1

B. 1/2(e-1)

C. 1/2(3e-1)

D. 0.2

**Answer: C**

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**169.** The solution of the differential equation $\frac{dy}{dx} = xe^{x-y}$ is

A. $e^{x-y} = c$

B. $e^x(xe^x + e^x) + c + 1 = 0$

C. $e^{x-y} = e^{xy}$

D. none of these

**Answer: D**

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**170.** $f(x)$and$g(x)$are two differentiable functions on $[0, 2]$ such that $f''(x) - g''(x) = 0$, $f'(1) = 4, g'(1) = 2, f(2) = 9, g(2) = 3,$ then $f(x) - g(x)$at $x = \frac{3}{2}$ is

A. 0

B. 2

C. 10

D. 5

**Answer: D**

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**171.** The differential equation : $\frac{dy}{dx} = \frac{\sqrt{1-y^2}}{y}$ determines a family of circles with :

A. Variable radii and fixed centre at (0,1)

B. Variable radii and fixed centre at (0, -1)

C. fixed radius 1 and variable centre along the x-axis

D. fixed radius 1 and variable centre along the y-axis

**Answer: C**

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**172.** Tangent is drawn at any point P of a curve which passes through (1,1) cutting x-axis and y-axis at A and B respectively. If BP : AP = 3:1 then

A. the differential equation of the curve is 3x dy/dx+y = 0 and the curve passes through (1/8,2)

B. the differential equation of the curve is 3x dy/dx -y-0 and the curve pass through (1/8,2)

C. the curve passes through (-1/8.-2)

D. the normal at (1,1) is x+ 3y = 4

**Answer: A**

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**173.** The interval contained in the domain of definition of non-zero solutions of the differential equation $(x-3)^2 y' + y = 0$ is

A. $\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$

B. $(0, \pi)$

C. $(0, 2\pi)$

D. $(-\pi, \pi)$

**Answer: A**

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**174.** Let f be a real values differentiable function on R such that f(1) =1. If the y intercept of the tangent at any P(x,y) on the curve y = f(x) is equal to cube of the abscissa of P, then the value of f(-3) is equal to

A. 3

B. 6

C. 9

D. 0

**Answer: C**

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**175.** The solution of the differential equation :

$(1+y^2)+\left(x-e^{\tan^{-1}y}\right)\frac{dy}{dx}=0$ is :

A. $xe^{2\tan^{-1}y}=e^{\tan^{-1}y}+k$

B. $(x-2)=ke^{\tan^{-1}y}$

C. $2xe^{\tan^{-1}y}-e^{2\tan^{-1}y}+k$

D. $xe^{\tan^{-1}y}-\tan^{-1}y+k$

**Answer: C**

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**176.** The differential equation of all circles which pass through origin and whose centres lie on y - axis is :

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

B. $\left(x^2 - y^2\right)\frac{dy}{dx} - xy = 0$

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

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

**Answer: D**

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**177.** A function y = f(x) has a second order derivative $f''(x) = 6(x-1)$. If its graph passes thro' the point (2, 1) and at the point the tangent to the graph is $y = 3x - 5$, then the function is :

A. $(x+1)^2$

B. $(x-1)^3$

C. $(x+1)^2$

D. $(x-1)^2$

**Answer: B**

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**178.** If $x\frac{dy}{dx} = y(\log y - \log x + 1)$, then the solution of the equation is :

A. log (x/y) = cy

B. log (y/x) = cx

C. x log(y/x) - cy

D. y log (x/y) = cx

**Answer: B**

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**179.** The differential equation whose solution is $Ax^2 + By^2 = 1$, where A and B are arbitrary constants , is of :

A. second order and second degree

B. first order and second degree

C. first order and first degree

D. second order and first degree

**Answer: D**

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**180.** The differential equation of family of circles with fixed radius 5 units and centre on the line y=2 is

A. $(y-2)^2(y')^2 = 25-(y-2)^2$

B. $(x-2)^2(y')^2 = 25-(y-2)^2$

C. $(x-2)(y')^2 = 25-(y-2)^2$

D. $(y-2)(y')^2 = 25-(y-2)^2$

**Answer: A**

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**181.** The differential equation which represents the family of curves $y = c_1 e^{c_2 x}$ where $c_1$ and $c_2$ are arbitrary constants , is :

A. $yy'' = (y')^2$

B. $y' = y^2$

C. $y'' = y'y$

D. $yy'' = y'$

**Answer: A**

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**182.** Solution of the differential equation cos x dy = y (sin x - y) dx $0 < x < \frac{\pi}{2}$ is

A. y tan x = sec x + c

B. tan x = (sec x + c)y

C. sec x = (tan x + c)y

D. y sec x = tan x + c

**Answer: C**

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**183.** The general solution of $y^2dx + \left(x^2 - xy + y^2\right)dy = 0$ is

A. $\tan^{-1}\left(\frac{x}{y}\right) + \log y + c = 0$

B. $2\tan^{-1}\left(\frac{x}{y}\right) + \log y + c = 0$

C. $\log\left(y + \sqrt{x^2 + y^2}\right) + \log y + c = 0$

D. $\log y = \tan^{-1}\left(\frac{y}{x}\right) + c$

**Answer: D**

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**184.** The differential equation of the family of parabola with focus at the origin and the x-axis as axis is

A. $y\left(\frac{dy}{dx}\right)+4x\frac{dy}{dx}=4y$

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

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

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

**Answer: B**

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**185.** Integrating factor of the differential equation $\cos x \, dy/dx + y \sin x = 1$ is

A. $\sin x$

B. $\sec x$

C. $\tan x$

D. $\cos x$

**Answer: B**

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**186.** The differential equation $\frac{dy}{dx} + Py = Qy^n, n > 2$ can be reduced to linear form by substituting

A. $z = y^{n-1}$

B. $z = y^n$

C. $z = y^{n+1}$

D. $z = y^{1+n}$

**Answer: D**

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**187.** The function $f(\theta) = \frac{d}{d}\theta\int_0^{\theta} \frac{dx}{1-\cos\theta\cos x}$ satisfies the differential equation

A. $\frac{df}{d\theta} + 2f(\theta)\cot\theta = 0$

B. $\frac{df}{d\theta} - 2f(\theta)\cot\theta = 0$

C. $\frac{df}{d\theta} + 2f(\theta) = 0$

D. $\frac{df}{d\theta} - 2f(\theta) = 0$

**Answer: A**

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**188.** The solution of the differential equation $\left(1+x^2\right)dy.\,dx+1+y^2=0$ is

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

B. $\tan^{-1}y-\tan^{-1}x=\tan^{-1}c$

C. $\tan^{-1}y\pm\tan^{-1}x=\tan^{-1}c$

D. $\tan^{-1}y+\tan^{-1}x=\tan^{-1}c$

**Answer: D**

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**189.** The differential equation of all parabolas whose axes are parallel to y-axis is

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

B. $\frac{d^2x}{dy^2} = c$

C. $\frac{d^3y}{dx^3} + \frac{d^2x}{dy^2} = 0$

D. $\frac{d^2y}{dx^4} + 2\frac{dy}{dx} = c$

**Answer: A**

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**190.** The solution of the differential equation $\frac{dy}{dx} + 1 = e^{x+y}$ is

A. `(x+y)e^(x+y) = 0

B. (x+c)e^(x+y) = 0

C. $(x - c)e^{x+y} = 1$

D. $(x - c)e^{x+y} + 1 = 0$

**Answer: D**

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**191.** Which of the following functions is a solution of the differential equation $\left(\frac{dy}{dx}\right)^2 - x\left(\frac{dy}{dx}\right) + y = 0$ ?

A. y =2

B. y = 2x

C. y =2x-4

D. $y = 2x^2 - 4$

**Answer: C**

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**192.** The general solution of $\frac{dy}{dx} + \sqrt{\frac{1-y^2}{1-x^2}} = 0$ is

A. $\tan^{-1} x + \cot^{-1} x = c$

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

C. $\sec^{-1} x + \operatorname{cosec}^{-1} x = c$

D. none of these

**Answer: B**

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**193.** The solution of cos(x+y)dy = dx is

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

B. `y = cos^(-1)(y/x)

C. y = x sec (y/x)

D. none of these

**Answer: A**

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**194.** The integrating factor of the differential equation :

$\frac{dy}{dx}(x \log x) + y = 2 \log x$ is :

A. log(log x)

B. $e^x$

C. log x

D. x

**Answer: C**

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**195.** $The solution of \frac{dy}{dx} + 2y \tan x = \sin x$ is

A. $y \sec^3 x = \sec^2 x + c$

B. $y \sec^2 x = \sec x + c$

C. $y \sin x = \tan x + c$

D. none of these

**Answer: B**

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**196.** Solution of the differential equation $xdy-ydx=0$ represents

A. a rectangular hyperbola

B. a straight line passing through the origin

C. Parabola whose vertex is at the origin

D. circle whose centre is at origin

**Answer: B**

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**197.** The solution of the differential equation $\frac{dy}{dx} + \frac{y}{x} = x^2$ is :

A. $y = \frac{x^2}{4} + cx^{-2}$

B. $y = x^{-1} + cx^{-3}$

C. $y = \frac{x^3}{4} + cx^{-1}$

D. $xy = x^2 + c$

**Answer:**

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**198.** The solution of the differential equation $\frac{dy}{dx} - \frac{\tan y}{x} = \frac{\tan y \sin y}{x^2}$ is

A. x/(sin y ) + log x = c

B. y/(sin x ) + log x = c

C. log y + x = c

D. log x + y = c

**Answer: A**

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**199.** The differential equation of family of curves $x^2 + y^2 - 2ax = 0$ is

A. $x^2 - y^2 + 2xyy' = 0$

B. $y^2 + x^2 = 2xyy'$

C. $x^2 + Y^2 + 2y'' = 0$

D. none of these

**Answer: A**

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**200.** The solution of the differential equation $\frac{dy}{dx} + \frac{2x}{1+x^2}y = \frac{1}{(1+x^2)^2}$ is

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

B. $y(1+x^2) = \tan^{-1} x + c$

C. $y(1+x^2)^2 = \tan^{-1} x + c$

D. $y(1-x^2)^2 = \tan^{-1} x + c$

**Answer: B**

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**201.** The solution of the equation dy/dx = (x+y)/(x-y) is

A. $c\left(x^2-y^2\right)^{\frac{1}{2}}+e^{\tan^{-1}\left(\frac{y}{x}\right)}=0$

B. $c\left(x^2+y^2\right)^{\frac{1}{2}}+e^{\tan^{-1}\left(\frac{y}{x}\right)}$

C. $c\left(x^2-y^2\right)^{\frac{1}{2}}+e^{\tan^{-1}\left(\frac{y}{x}\right)}$

D. none of these

**Answer: B**

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**202.** The solution of the differential equation $\left(x^2 - yx^2\right)\frac{dy}{dx} + y^2 + xy^2 = 0$ is

A. log (x/y) = 1/x+1/y+c

B. log (y/x) = 1/x+1/y+c

C. log(xy) = 1/x + 1/y + c

D. log(xy)+ 1/x + 1/y = c

**Answer: B**

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**203.** The degree and order of the differential equation of the family of all parabolas whose axis is x - axis, are respectively :

A. 2,1

B. 1,2

C. 3,2

D. none of these

**Answer: B**

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**204.** If a is an arbitrary constant, then solution of the different equation $\frac{dy}{dx} + \sqrt{\frac{1-y^2}{1-x^2}} = 0$is

A. $x\sqrt{1-y^2} + y\sqrt{1-x^2} = a$

B. $y\sqrt{1-y^2} + x\sqrt{1-x^2} = a$

C. $x\sqrt{1-y^2} - y\sqrt{1-x^2} = a$

D. $y\sqrt{1-y^2} - x\sqrt{1-x^2} = a$

**Answer: C**

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**205.** A curve having the condition that the slope of the tangent at some point is two times the slope of the straight line joining the same point to the origin of cordinates is a/an

A. circle

B. ellipse

C. parabola

D. hyperbola

**Answer: C**

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**206.** The differential equation of the family of circles passing through the fixed points (a, 0) and (-a, 0) is

A. $y_1\left(Y^2 - x^2 + a^2\right) + 2xy + a^2 = 0$

B. $Y_1 y^2 + xy + a^2 x^2 = 0$

C. $y_1\left(y^2 - x^2 + a^2\right) + 2xy = 0$

D. none of these

**Answer: C**

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