**Worksheet – Standard**

**Class XII**

**Chapter IX- Differential Equations**

## ONE MARK QUESTIONS

1. The differential equation of all circles passing through the origin and having there 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) $x^2 = y^2 + xy\frac{dy}{dx}$ (d) $x^2 = y^2 + 3xy\frac{dy}{dx}$

2. If the general solution of a differential equation is $y=c_1x^2+(c_2+c_3)x + c_4c_5$ , then the order of the differential equation is

(a) 5 (b) 4 (c ) 3 (d) none of these

3. The order of the differential equation of all circles of given radius is :

(a) 1 (b) 2 (c) 3 (d) 4

4. If dy/dx = y+3 >0 and y(0)=2, then y(ln2) is equal to

(a) -2 (b) 7 (c) 5 (d ) 13

5. If m is order n is degree of the differential equation

$$\left(\frac{d^2y}{dx^2}\right)^2 + 3\frac{dy}{dx} = \left(\frac{d^2y}{dx^2}\right)^5$$ then value of m+n is

(a) 8 (b) 6 (c) 7 (d) 5 .

6. The general solution of the differential equation is $\frac{y\,dx - x\,dy}{y} = 0$ is

(a) xy=c (b) $x=cy^2$ (c) y=cx (d) $y=cx^2$

7. A particular solution of the differential equation $\frac{d^2y}{dx^2} + 9\left(\frac{dy}{dx}\right)^2 + 5x = 0$ contains _____ number of arbitrary constants

8. Find the integrating factor of the differential equation

$$\log x \frac{dy}{dx} + y = 2\log x .$$

## Two Marks Questions

1. Given that $\frac{dy}{dx} = e^{-2y}$ and $y = 0$, when $x = 5$ find the value of x, when $y = 3$.

2. Show that the following differential equation is homogeneous.

$$y\,dx + x log\left|\frac{y}{x}\right| dy - 2x dy = 0.$$

3. write the integrating factor of the differential equation . $cosy\,dx = (secy - xsiny)dy$

4. Form the differential equation of family of ellipses having foci on y- axis and centre at the origin.

## FOUR MARKS QUESTIONS

1.Solve : $x\frac{dy}{dx} + y - x + xy\cot x = 0, (x \neq 0)$.

2. Solve : $\left(\frac{e^{-2\sqrt{x}}}{\sqrt{x}} - \frac{y}{\sqrt{x}}\right)\frac{dx}{dy} = 1\,, x \neq 0.$

3.Form the differential equation of the family of circles in the second quadrant and touching both the co-ordinate axes.

4. Solve : $(1 + e^{x/y})dx + e^{x/y}(1 - \frac{x}{y})dy=0$.

5. Find the particular solution of the differential equation:

x dy/dx – y + xcosec (y/x) =0 ,given that y=0 when x= 1.

6.Find the equation of curve through the point (1, 0) if the slope of the tangent to the curve at any point (x, y) is $\frac{y-1}{x^2+x}$.

7. Show that (x – y) dy =(x + 2y )dx is a homogenous differential equation. Also, find the general solution of the given differential equation.

8.Find the solution of the differential equation,

$\frac{dx}{dy} + x\cot y = 2y + y^2 \cot y, (y \neq 0)$