JAYAM TUITION CENTRE.

VETTAVALAM. TIRUVANNAMALAI-DT.

EXERCISE TEST -14 (EX:10-4)

2Mark Questions   5 X 2 =10

1. Show that each of the following expressions is a solution of the corresponding given differential equation.

   $$y = 2x^2 \quad ; \quad xy' = 2y$$

2. Show that each of the following expressions is a solution of the corresponding given differential equation. $y = ae^x + be^{-x}$; $y'' - y = 0$

3. Find the differential equation of the family of all ellipses having foci on the x -axis and centre at the origin.

4. Show that $y = mx + \dfrac{7}{m}, m \neq 0$ is a solution of the differential equation

   $xy' + 7\dfrac{1}{y'} - y = 0$.

5. Show that $y = 2(x^2 - 1) + ce^{-x^2}$ is a solution of the differential equation $\dfrac{dy}{dx} + 2xy - 4x^3 = 0$.

5 Mark Questions   3 X 5 =15

6. Show that $y = a\cos(\log x) + b\sin(\log x), x > 0$ is a solution of the differential equation $x^2 y'' + xy' + y = 0$.

7. Show that the differential equation representing the family of curves

   $y^2 = 2a\left(x + a^{\frac{2}{3}}\right)$, where a is a positive parameter, is $\left(y^2 - 2xy\dfrac{dy}{dx}\right)^3 = 8\left(y\dfrac{dy}{dx}\right)^5$.

8. Find value of m so that the function $y = e^{mx}$ is a solution of the given differential equation.

   (i) $y' + 2y = 0$ (ii) $y'' - 5y' + 6y = 0$