DIFFERENTIAL EQUATIONS	CM120901

1. Find order and degree of $5\frac{d^2y}{dx^2} = \left\{1 + \left(\frac{dy}{dx}\right)^2\right\}^{3/2}$.

2. Find order and degree of $y = px\sqrt{a^2p^2 + b^2}$, where $p = \frac{dy}{dx}$.

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

4. Find the general solution of the following differential equation: $xdy - (y + 2x^2)dx = 0$.

5. Solve the differential equation: $xdy - ydx = \sqrt{x^2 + y^2}dx$.

6. Solve : $\frac{dy}{dx} = \frac{1-\cos x}{1+\cos x}$.

7. Solve : $(1 + x^2)\frac{dy}{dx} - x = 2\tan^{-1} x$.

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

9. Solve : $y(1 + e^{ex})dy = (y + 1)e^x dx$.

10. Solve : $(y + xy)dx + (x - xy^2)dy = 0$.

11. Solve : $\frac{dy}{dx} = 1 - x + y - xy$.

12. Solve : $\frac{dy}{dx} = \frac{x+y}{x-y}$.

13. Solve : $2xy\frac{dy}{dx} = x^2 + y^2$.

14. Solve : $x^2\frac{dy}{dx} = x^2 - 2y^2 + xy$.

15. Solve : $xy\frac{dy}{dx} = x^2 - y^2$.

16. Solve : $(x^2 + 3xy + y^2)dx - x^2dy = 0$.

17. Solve : $\frac{dy}{dx} + \frac{4x}{x^2+1}y + \frac{1}{(x^2+1)^2} = 0$.

18. Solve : $\frac{dy}{dx} + y\cot x = x^2\cos^2 x + 2x$.

19. Solve the differential equation $(x + 2y^2)\frac{dy}{dx} = y$, give that when $x = 2, y = 1$.

20. Solve : $(1 + x^2)\frac{dy}{dx} - 2xy = (x^2 + 2)(x^2 + 1)$.