There are **Four** questions. Answer any **Three** of the questions.

1.	a)	What do you mean by order and degree of the differential equation (D. E.).	
	b)	Find the order and degree of the following D. E. (i) $\left(\dfrac{dy}{dx}\right)^2 + 2y^2 = 5\left(\dfrac{dy}{dx}\right) + 4y$ (ii) $\dfrac{d^2y}{dx^2} - \left(\dfrac{dy}{dx}\right)^3 - 9y = x.$	
2.		Find the D.E. of all parabolas whose solution is $y = a + b\ln x + c(\ln x)^2 + 3x^2$, where a, b and c are arbitrary constants.	
3.		Solve following differential equations: i) $x\dfrac{dy}{dx} + \dfrac{2}{x}y = x\log x.$ ii) $\dfrac{dy}{dx} + \dfrac{2}{x}y = \dfrac{y^3}{x^3}.$	
4.		Solve following Cauchy-Euler equation: $x^3\dfrac{d^3y}{dx^3} + 2x^2\dfrac{d^2y}{dx^2} + +2y = 10(x + \dfrac{1}{x})$	