Jagannath University, Dhaka

Department of CSE

Mid-Examination-2020

Course Code: CSER-2105, Math-III, Ordinary Differential Equations

Full Marks: 10 Time: 30 minutes

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) $\left(\frac{dy}{dx}\right)^2 + 2y^2 = 5\left(\frac{dy}{dx}\right) + 4y$ (ii) $\frac{d^3y}{dx^3} + 3\left(\frac{d^2y}{dx^2}\right)^2 - \frac{dy}{dx} + y = 0$ (iii) $\frac{d^2y}{dx^2} - \left(\frac{dy}{dx}\right)^3 - 9y = x.$	
2.		(i) Form the D.E. of all parabolas whose axes are parallel to the axis of y. (ii) Form the D.E. of the family of curves $y = e^x(A\cos x + B\sin x)$.	
3.		Solve following differential equations: i) $x\frac{dy}{dx} - y = x\sqrt{x^2 + y^2}.$ ii) $x\frac{dy}{dx} + \frac{2}{x}y = x\log x.$	
4.		Solve following Cauchy-Euler equation: $x^3\frac{d^3y}{dx^3} + 6x^2\frac{d^2y}{dx^2} + 8x\frac{dy}{dx} + 2y = x^2 + 3x - 4.$	