



# 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) $\left(\frac{d^2y}{dx^2}\right)^2 - y = e^x.$  (iii) $\frac{d^2y}{dx^2} - \left(\frac{dy}{dx}\right)^3 - 9y = x.$	
2.		Form the D.E. of the family of circles touch the y-axis at origin.	
3.		Solve following differential equations: i) $\frac{d^2y}{dx^2} - y = xe^x \sin x.$  ii) $x \frac{dy}{dx} + y = y^2 \ln x$	
4.		Solve following Cauchy-Euler equation: $x^2 \frac{d^2y}{dx^2} - x \frac{dy}{dx} - 3y = x^2 \log x.$	