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) $\frac{dy}{dx}=\sqrt{\frac{1-x}{1-y}}$ (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.		Find the D.E. whose solution is $y^2=4a(x+a).$,	
3.		Solve following differential equations: i) $\frac{dy}{dx}+\frac{2}{x}y=\frac{y^3}{x^3}.$ ii) $(1+x^2)\frac{dy}{dx}+y=e^{\tan^{-1}x}.$	
4.		Solve following Cauchy-Euler equation: $x^3\frac{d^3y}{dx^3}+2x^2\frac{d^2y}{dx^2}-x\frac{dy}{dx}+y=\frac{1}{x}.$