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) $\frac{d^3y}{dx^3}+3\left(\frac{d^2y}{dx^2}\right)^2-\frac{dy}{dx}+y=0$ (ii) $\left(\frac{d^2y}{dx^2}\right)^2-y=e^x.$ (iii) $x\frac{dy}{dx}-5y=\sqrt{x^2+y^2}.$	
2.		Form the D.E. of the family of circles touch the x-axis at origin.	
3.		Solve following differential equations: i) $(1+x^2)\frac{dy}{dx}+y=\tan^{-1}x.$ ii) $x\frac{dy}{dx}+y=y^2\ln x$	
4.		Solve following Cauchy-Euler equation: $x^3\frac{d^3y}{dx^3}+6x^2\frac{d^2y}{dx^2}+8x\frac{dy}{dx}+2y=x^2+3x-4.$	