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Department of Scientific Computing  
M.Sc I (Semester I) 2018-2019  
Subject: SC 103 Foundations Scientific Computing I  
Internal Test

Differential equation

1. Solve  $(x \cos \frac{y}{x}) \frac{dy}{dx} = y \cos \frac{y}{x} + x$   
OR  
 $y^2 dx + (x^2 + xy + y^2) dy = 0$  3 marks
2. Solve  $(1 + x^2) dy + (y - e^{\tan^{-1} x}) dx = 0$   
given that when  $x = 0$  then  $y = 0$  4 marks
3. Solve  $\frac{d^2 y}{dx^2} + y = \operatorname{cosec} x$   
OR  
 $(D^2 - 6D + 9)y = \frac{e^{3x}}{x^2}$  3 marks