Assignment-1

Varendra University

Department of Computer Science and Engineering

3rd Semester, Examination: Spring-2025

Course Code: **MAT 2141**

Course Title: Differential Equations

Submission Time: Before 07.02.2025 **Section: A-E** **Marks: 10**

(Answer all of the following questions)
All part of each question must be answered sequentially.

1. If the differential equation is $xlnx\frac{dy}{dx} + y = x^2$ where $y(1) = 2$. Evaluate the following cases **2.5**

i. The general solution of the given differential equation.

ii. The particular solution of the given differential equation.

iii. Express the dependent variable in terms of independent variable from particular solution.

2. Solve the following linear equations $x(1-x^2)dy + (2x^{2y} - y - ax^3)dx = 0$. **1.5**

3. Examine the following equations can be reduced to linear form and solve them $(ylogx - 1)ydx = xdy$. **1.5**

4. Test the following equations can be reduced to linear form and solve them $y + 2\frac{dy}{dx} = y^3(x-1)$. **1.5**

5. Solve the following equations $(x^2 - 4xy - 2y^2)dx + (y^2 - 4xy - 2x^2)dy = 0$. **1.5**

6. Solve the following equations $cosx(cosx - sinasiny)dx + cosy(cosy - sinasinx)dy = 0$. **1.5**