

TEZPUR UNIVERSITY
Assignment (Spring) 2018
MMS203: Ordinary Differential Equations

Total Marks: 30

The figures in the right-hand margin indicate marks for the individual question.

All questions are compulsory.

Answers should be concise and entire answer to a question should be together. State assumptions wherever made.

1. Is the equation $(2xy^4e^y + 2xy^3 + y) dx + (x^2y^4e^y - x^2y^2 - 3x) dy = 0$ exact, justify. If not, find the integrating factor and solve the equation. **2+5**
2. Solve the following two equations by method of undetermined coefficients.

$$y'' + 6y' + 9y = 24e^{-3x}.$$

$$y'' - 4y' + y = x^2 - 2x + 2.$$

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3. State and prove Peano Existence Result. Show with an example why continuity is not necessary for the existence of the solution. **8**
4. Can a series solution about $x = 0$ for the differential equation $y'' - xy' - y = 0$ be determined? If yes, find the solution. **2+6**

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