SIIT GTS211 MIDTERM EXAM 1ST SEMESTER 2006 DR. RUBEN

Problem 1. Find a particular solution of $y'' - y' - 2y = e^{2x}$

Problem 2. Find the general solution of $(1+x)\,y' = \dfrac{1}{\cos y}$

Problem 3. Find the general solution of $y' - 2y = 5$

Problem 4. Using a table of Laplace transforms find the inverse Laplace transform of $\mathfrak{I}(s) = \dfrac{2s-2}{s^2-2s-8}$

Problem 5. Find the general solution of $y' = 2t \cos t^2$

Problem 6. Find in explicit form the general solution of

$$2x \sin y\, dx + x^2 \cos y\, dy = 0$$

Problem 7. Solve the initial value problem

$$y'' - 6y' + 9 = 0, \quad y(0) = 1, \quad y'(0) = -2$$

Problem 8. Knowing that $y_1 = x^{-2}$ is a solution of

$$y'' + \frac{y'}{x} - \frac{4y}{x^2} = 0,$$

use the method of reduction of order to find a second, linearly independent solution y_2

Problem 9. Solve the Bernouilli equation $y' + 2y = 2xy^{3/2}$

Problem 10. Find the general solution of $y' - 3y = e^{-x}$

Problem 11. Find by integration the Laplace transform of $f(t) = 1 + t$ (using the table of Laplace transform in this problem is not valid)