NDU

MAT 235

Ordinary Differential Equations

Exam # 2

Duration: 55 minutes

Name: _____

Section: _____

Instructor: _____

Grade: _____

MAT 235 – Exam #2; Wednesday May 26, 2004

Name:

Instructor:

Please note that you have 5 questions and 7 pages and your mobile must be turned off and unseen

1) (12 points) Solve $y^{(5)} + 4y^{(4)} + 7y''' = 0$

2) **(15 points)** Given that $y_1 = e^{-x}$ is a particular solution of the homogeneous equation $(x+1)y'' + xy' - y = 0$; for $x > -1$. Find its general solution.

3) (20 points) Solve $x^2 y'' - xy' - 3y = 4x^4 \ln x$; for $x > 0$.

4) (20 points) Solve $y'' + 4y' - 5y = 24e^x + 26\sin x$.

5) (33 points) Given $xy'' + 2y' + xy = 0$, for $x > 0$.

a) Show that $x_0 = 0$ is a regular singular point.

b) Find the indicial roots.

c) Find the generalized power series solution in powers of x.