

Philadelphia University  
Faculty of Engineering

Student Name:  
Student Number:

Dept. of Communications & Electronics  
Second Exam, Summer Semester: 2004/2005

Course Title: Engineering Analysis I	Date: 13/8/2005
Course No: (630201)	Time Allowed: 1 Hours
Lecturer: Dr. Abdel-Rahman Al-Qawasmi	No. of Pages: 1

**Question 1:** **(5 Marks)**

**Objective: About Second Order Ordinary Differential Equations.**

Solve the following Euler-Cauchy Second order Differential Equation

$$x^2 y'' - 2xy' - 6y = x^3$$

**Question 2:** **(6 Marks)**

**Objective: About Laplace Transform**

a- Find the Laplace Transform of:

$$f(t) = \frac{t \cosh 3t}{\sqrt{2}e^t}$$

b- Find the Inverse Laplace Transform of:

$$1- F(s) = \frac{3s + 2}{s^2 + 2s + 2}$$

$$2- F(s) = 5e^{2s} + \left( \frac{8s^2 - 4s + 12}{s(s^2 + 4)} \right) e^{-3s}$$

**Question 3:** **(5 Mark)**

**Objective: Higher Order ordinary Differential Equations**

Solve the following Differential Equation:

$$y^{(4)} + 2y'' + y = x + e^{-2x}$$

**Question 4:** **(4 Mark)**

**Objective: Laplace Transform**

Use Laplace transform to solve the initial value problem;

$$y'' + y = \sin 2(t-2)u(t-2) \quad y(0) = 2, y'(0) = 1$$