

Philadelphia University
Faculty of Engineering

Student Name:
Student Number:

Dept. of Communications & Electronics
Second Exam, Second Semester: 2005/2006

Course Title: Engineering Analysis I

Date: 17/5/2006

Course No: (630201)

Time Allowed: 1 Hours

Lecturer: Dr. Abdel-Rahman Al-Qawasmi

No. of Pages: 1

Question 1:

(6 Marks)

Objective: About Higher Order Ordinary Differential Equations.

Solve the following Euler-Cauchy Higher order Differential Equation

$$x^3 y''' + x^2 y'' + xy' - y = 0$$

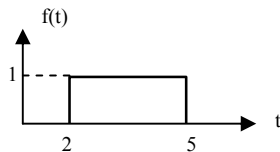
Question 2:

(8 Marks)

Objective: About Laplace Transform

a- Find the Laplace Transform of:

1-



2- $f(t) = e^{2x} \cosh 2x \sin 2x$

3- $f(t) = t^2 \sinh 3x$

4- $f(t) = (t^2 - 1)^2$

b- Derive the Laplace Transform of $t^2 e^x$

c- Find the Inverse Laplace Transform of $\frac{2s - a}{s^2 + 4}$, where a is a constant.

d- Use the Laplace Transform to solve the initial value problem:

$$y'' = \sin x \quad y(0) = y'(0) = 0$$

Question 3:

(6 Mark)

Objective: Higher Order ordinary Differential Equations

Use the method of variation of parameters to find y_p for the differential equation:

$$y''' - y' = 2$$

if $y_h = c_1 + c_2 e^x + c_3 e^{-x}$ and find the particular solution if $y(0) = y'(0) = y''(0) = 1$