

Philadelphia University
Faculty of Engineering

Student Name:
Student Number:

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

Course Title: Engineering Analysis I	Date: 19/04/2006
Course No: (630201)	Time Allowed: 1 Hours
Lecturer: Dr. Abdel-Rahman Al-Qawasmi Section 3	No. of Pages: 1

Question 1: **(3 Marks)**

Objective: About Separable Differential Equations

Solve the following Initial Value Problem.

$$\frac{y'}{1+x} = y, y(0) = 2$$

Question 2: **(4 Marks)**

Objective: About Exact Differential equations

a- Check the Exactness and find the general solution.

$$\cos x \cos y dx - \sin x \sin y dy = 0$$

Question 3: **(4 Mark)**

Objective: Method of reduction of order

Use method of reduction of order to find y_2 and find the general solution if:

$y_1 = \cos x$ and

$$y'' - \cot(x)y' = 0$$

Question 4: **(6 Mark)**

Objective: linear second order homogeneous differential equations.

1- Solve the following linear differential equations.

$$(x^2 D^2 + xD + 4)y = 0$$

2- Solve the following Initial Value Problem

$$y'' + 2y' - 24y = 0 \quad y(0) = 0, y'(0) = 10$$

Question 5: **(3 Mark)**

Objective: verification of solutions

Verify that if $y_1 = \sin(x)$ is a basis of solutions of the differential equation.

$$xy'' + 2y' + xy = 0$$