

Form No. T631

Philadelphia University  
Faculty of Engineering

Student Name:  
Student Number:

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

Course Title: Engineering Analysis I	Date: 21/07/2005
Course No: (630201)	Time Allowed: 1 Hours
Lecturer: Dr. Abdel-Rahman Al-Qawasmi Section 2	No. of Pages: 1

**Question 1:** \_\_\_\_\_ (4 Marks)

**Objective:** About Separable Differential Equations

Solve the following Initial Value Problem and check your answer.

$$y' = e^{x+y}, y(0) = 1$$

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

**Objective:** About Exact Differential equations

a- Check the Exactness and find the general solution.

$$y \cos(x)dx + 2 \sin x dy = 0$$

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

**Objective:** Second Order ordinary Differential Equations

Find the general solution of the following differential equation. (Check your answer)

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

**Question 4:** \_\_\_\_\_ (5 Mark)

**Objective:** Modeling of RC-circuit.

- 1- A capacitor ( $c=0.1 \mu$  farad) is connected series with a resistor ( $R=?$  Ohms) is charged from a source ( $E_0$ ). Model the electric circuit and find R so that the current will reach 50% of its maximum value after 2ms. Assume that at  $t=0$  the current in circuit=1 mA.
- 2- Find  $E_0$ .