Kingdom of Saudi Arabia
King Abdulaziz University

Faculty of Science –Mathematics Department
First Mid-Term Exam (90 Minutes) - (204 Math).
12/4/1433 H – 5/3/2012 A.D. Second Semester

1432-1433 H

Model A

Name:	**Section:**
Student's I.N. :	**Serial Number:**

Q_1	Q_2	Q_3	Q_4	Q_5	**Total Marks (25)**

(Answer the following questions)

1 Choose the correct answer (writing details (iii) and (iv) only) **[6 Marks]**

(i) The order of differential equation $\frac{d^3y}{dx^3} + y = e^x$ is third.

(a) true (b) false

(ii) The differential equation $y\,dx = (\cos x\ - y - x\,y)dy$ is linear in x.

(a) true (b) false

(iii) The differential equation $\frac{dy}{dx} = y^2 - 4$ has the solution $y = -2$ as

(a) a singular solution (b) a particular solution

(iv) According to the Existence and Uniqueness Theorem the IVP:

$\frac{dy}{dx} = \sqrt{y^2 - 9}\,,\ y(2) = 4$ has

(a) unique solution (b) an infinitely many solutions (c) no solution

2 **Solve the differential equation:** **[5 Marks]**

$$(e^{2y} - y)\cos x \frac{dy}{dx} = e^{y} \sin 2x$$

3 **Solve the differential equation:** **[5 Marks]**

$$\frac{dy}{dx} + \frac{1}{x}y = x^2y^2$$

4 **Solve the differential equation:** **[5 Marks]**

$$\frac{dy}{dx} = \frac{x + y^2 \sin x - y^3}{3xy^2 + 2y \cos x}$$

5 **Solve the differential equation:** **[4 Marks]**

$$(y^2 + xy)dx - x^2dy = 0$$