Kingdom of Saudi Arabia
King Abdulaziz University

Faculty of Science –Mathematics Department
First Mid-Term Exam (90 Minutes) - (204 Math).
23/8/1432 H – 24/7/2011 A.D. First Semester

1432-1433 H

Model A

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

Q_1	Q_2	Q_3	Q_4	Q_5	Q_6	**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 $\frac{d^2y}{dx^2} + 2(\frac{dy}{dx})^3 - y = e^x$ is third.

(a) true   (b) false

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

(a) true   (b) false

(iii)   The differential equation $\frac{dy}{dx} = y(1 - y)$ has the solution $y = 1$ as

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

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

$\frac{dy}{dx} = \sqrt{xy}$, $y(2) = 1$ has

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

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

$$\frac{dy}{dx} = \frac{xy + 3x - y - 3}{xy - 2x + 4y - 8}$$

3 **Solve the differential equation:**

$$xdx + (x^2y + 4y)dy = 0, \qquad y(4) = 0$$

4 **Solve the differential equation:**

$$\frac{dy}{dx} = y(xy^3 - 1)$$

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

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

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

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