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	MIDTERM EXAMINATION SPRING 2007 MTH401 - DIFFERENTIAL EQUATIONS (Session - 4)	Marks: 40 Time: 90min

StudentID/LoginID: _____

Student Name: _____

Center Name/Code: _____

Exam Date: Friday, May 18, 2007

Please read the following instructions carefully before attempting any of the questions:

1. Attempt all questions. Marks are written adjacent to each question.

2. Do not ask any questions about the contents of this examination from anyone.

a. If you think that there is something wrong with any of the questions, attempt it to the best of your understanding.

b. If you believe that some essential piece of information is missing, make an appropriate assumption and use it to solve the problem.

c. Write all steps, missing steps may lead to deduction of marks.

****WARNING: Please note that Virtual University takes serious note of unfair means. Anyone found involved in cheating will get an `F` grade in this course.**

For Teacher's use only											
Question Marks	1	2	3	4	5	6	7	8	9		Total

Question No: 1 (Marks: 1) - Please choose one

The differential equation

$(3x^2y + 2)dx + (x^3 + y)dy = 0$

is

- Exact
- Linear
- Homogenous
- Separable

Question No: 2 (Marks: 1) - Please choose one

The assumed particular solution for the U.C(Undetermined Coefficient) differential equation $y' - y = x^2 e^{2x}$ is

- $y_p = c_1 e^{x^2} + c_2 x^2$
- $y_p = (Ax + B)e^{2x}$
- $y_p = (Ax^2 + Bx + c)e^{2x}$
- None of these.

Question No: 3 (Marks: 1) - Please choose one

The differential equation $x\frac{dy}{dx} + y = y^2 \ln x$ is an example of

- Separable
- Homogenous
- Exact
- None of these.

Question No: 4 (Marks: 1) - Please choose one

For the differential equation
$y' - 2xy = x$
Integrating factor is

- $-x^2$
- e^{x^2}

- e^{-x^2}
- x^2

Question No: 5 (Marks: 1) - Please choose one

$$\frac{dy}{dx}=\frac{x+3y-5}{x-y-1}$$

Identify the ordinary differential equation

- Homogenous
- Separable
- Exact
- None of these.

Question No: 6 (Marks: 5)

Solve the differential equation

$$\frac{dy}{dx}+\sqrt{\frac{1-y^2}{1-x^2}}=0$$

Question No: 7 (Marks: 10)

Solve

$$(ySec^2x+Secx\tan x)\,dx+(\tan x+2y)\,dy=0$$

Question No: 8 (Marks: 10)

Find the equation of orthogonal trajectories of the curve

$$x^2+y^2=cx$$

Question No: 9 (Marks: 10)

Solve the differential equation by method of variations of parameters

$$\frac{d^2y}{dx^2}+y=\tan x\sec x$$