Assignment 1

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1 ODEMC Lesson Plan

1.1 Unit 1

A first-order differential equation is defined by an equation:(x,y) of two variables x and y with its function f(x,y) defined on a region in the xy-plane. It has only the first derivative dy/dx so that the equation is of the first order and no higher-order derivatives exist
1. Review of first order differential equations
2. Reduction of order
3.Linear Differential Equations

1.2 Unit 2

Laplace transform is the integral transform of the given derivative function with real variable t to convert into a complex function with variable s. For let f(t) be given and assume the function satisfies certain conditions to be stated later on. 1. Laplace Transform
2. Properties
3. Unit step function

1.3 Unit 3

A function of variables, also called a function of several variables, with domain is a relation that assigns to every ordered -tuple in a unique real number in . We denote this by each of the following types of notation. The range of is the set of all outputs of . It is a subset of , not . 1. Functions of several variables
2. Level curves and level surfaces
3. Partial and directional derivatives

2 Assignment 2 - Mathematical equations

Q.1) Solve the following:

(a)$3x(xy-2)dx+(x^3+2y)dy=0$ [CO 2] [2]

(b)$(2\cos y+4x^2)dx-x\sin ydy==0$ [CO 2] [3]

Q.2) Find a homogeneous linear second order ordinary differential equation whose solution is the set of all straight lines in the xy-plane. [CO 1] [1]

Q.3)State whether the following differential equations are linear or non linear ,justify and solve:

(a)$xy'+2y=\frac{e^{3x}}{x}, x>0 with y(1)=1+\frac{e^3}{3}$. [CO 2] [3]

(b)$x^2y\frac{dy}{dx}-xy^2=1$ [CO 2] [3]

Q.4) If x^2 and 1 are solutions of $yy''-xy'=0$ then so is any linear combination of these. State true or false and justify. [CO 4] [2]

Q.5) Find a linear ordinary differential equation for which the function $e^{-x}\cos 2x$ and $e^{-x}\sin 2x$ are linearly independent solutions. [CO 2] [3]

Q.6) Make a matrix $\begin{bmatrix}1 & 2 & 3\\ a & b & c\end{bmatrix}$

3 Inserting Images

Figure 1: figure

4 Tables using latex

Table 1: Price of various fruits

Sr. no.	**Fruits**	**Price**
1	Apple	20
2	Orange	40
3	Guava	50
4	Banana	60
5	Pineapple	10