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ASSIGNMENT.

SUBJECT : Differential
Equations.

Submitted TO | "Madam.

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ORDINARY DIFFERENTIAL EQUATION I -

An equation contains only ordinary derivatives of one or more dependent variables of a single independent variable.

for examp

$$\frac{dy}{dx} + 5y = e^x, \left(\frac{dx}{dt}\right) +$$

$$\left(\frac{dy}{dt}\right) = 2x + y.$$

* APPLICATIONS I -

=> modelling with first-order equations -

- (1) Newton's law of cooling
- (2) Electrical circuits.

=> Modelling free mechanical oscillations :-

(1) No damping.

(2) Light damping.

(3) Heavy damping.

=> Modelling forced mechanical oscillations.

=> Computer Exercise or Activity.

* PARTIAL DIFFERENTIAL EQ:-

An equation containing partial derivatives of one or more dependent variables of two or more independent variables.

For example:-

$$\frac{\partial^2 U}{\partial x^2} + \frac{\partial^2 U}{\partial t^2} = 2 \frac{\partial U}{\partial t}$$

$$\frac{\partial U}{\partial y} = -\frac{\partial U}{\partial x}$$

* APPLICATIONS -
PDE's are used
to model many systems
in many different fields
of science & engineering

⇒ Laplace equation.

⇒ Heat equation.

⇒ Wave equation.

