23.01.2021

Programme Report

Name of the Programme: Workshop on Differential Equations
Date: 23rd January 2021

The department organized an online workshop on Differential Equations through google meet on 23rd January 2021 at 4 pm. The Workshop on Differential Equations provided participants with an in-depth study of the fundamental concepts of Differential Equations. The session addressed previous years' JAM Mathematics questions in the that area. Sruthi Chundakkaran (Assistant Professor, Department of Mathematics, Co-operative Arts & Science College, Madayi) managed the session and discussed the topic second order differential equation and some related problems. The session aimed to strengthen participants' problem-solving skills, foster collaboration, and explore various problem-solving techniques in the context. Final Year BSc Mathematics Students of the department actively attended the session.

DEPARTMENT OF MATHEMATICS
Co-operative Arts and Science College, Madayi
Payangadi RS. (PO) , Kannur, Kerala-670358

WORKSHOP ON
DIFFERENTIAL EQUATIONS

Resourse Person:

Smt. Sruthi Chundakkaran
Assistant Professor
Department of Mathematics
CAS College, Madayi

Faculty Co-ordinators:
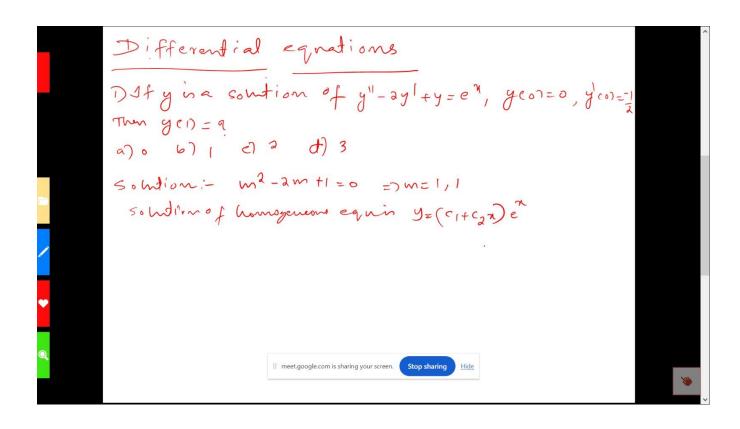
Dr.Shijina.V
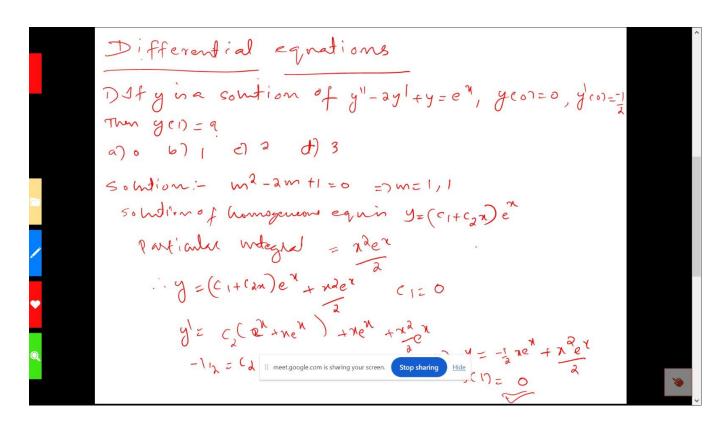(Assistant Professor & HOD)

Smt. Sruthi Chundakkaran
(Assistant Professor)

on
23rd January 2021, 4 pm

via; Google Meet

Differential equations

1) If y is a solution of $y'' - 2y' + y = e^x$, $y(0) = 0$, $y'(0) = \frac{-1}{2}$

Then $y(1) = ?$

a) 0   b) 1   c) 2   d) 3

Solution:- $m^2 - 2m + 1 = 0 \implies m = 1, 1$

solution of homogeneous equation $y = (c_1 + c_2 x) e^x$

Particular integral $= \frac{x^2 e^x}{2}$

$\therefore y = (c_1 + c_2 x) e^x + \frac{x^2 e^x}{2}$ $c_1 = 0$

$y' = c_2(e^x + x e^x) + x e^x + \frac{x^2}{2} e^x$

$-\frac{1}{2} = c_2$ $\implies y = -\frac{1}{2} x e^x + \frac{x^2 e^x}{2}$

$y(1) = 0$

2) Consider the initial value problem $\frac{dy}{dx} + \alpha y = 0$, $y(0) = 1$ where $\alpha \in \mathbb{R}$

a) There is an α such that $y(1) = 0$

b) There is a unique α such that $\lim_{n \to \infty} y(n) = 0$

c) There is no α such that $y(2) = 1$

d) There is a unique α such that $y(1) = 2$

soln:- soln of diff. equ is $y = c_1 e^{-\alpha x}$

$$1 = c_1$$

$$y = e^{-\alpha x}$$

$$\alpha = 1 \quad y = e^{-x}$$

$$\alpha = 2 \quad y = e^{-2x}$$

$$\alpha > 0$$

$$y = e^{-\alpha x}$$

$$y(2) = e^{-2\alpha} = 1$$

$$-2\alpha = \log 1$$

$$y(1) = 2$$

$$2 = e^{-\alpha}$$

$$\alpha = -\log 2$$

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