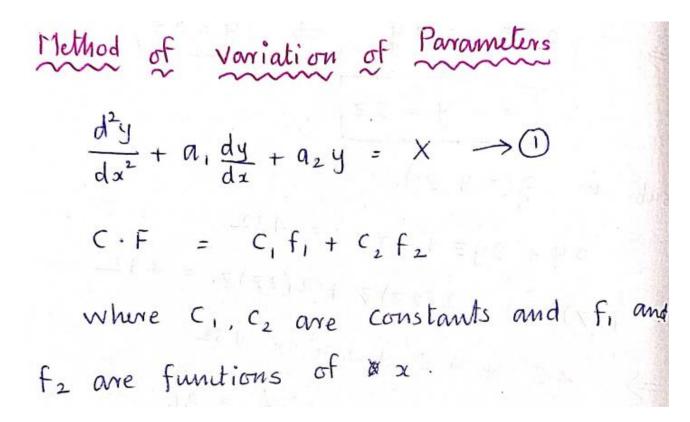SNS COLLEGE OF ENGINEERING

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Topic: 5.4- METHOD OF VARIATION OF PARAMETERS

Method of Variation of Parameters

$$\frac{d^2y}{dx^2} + a_1\frac{dy}{dx} + a_2 y = X \longrightarrow ①$$

$$C \cdot F = c_1 f_1 + c_2 f_2$$

where c_1, c_2 are constants and f_1 and f_2 are functions of x.

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Then, $P \cdot I = P f_1 + Q f_2$

$$P = -\int \frac{f_2 X}{f_1 f_2' - f_2 f_1'} dx$$

$$Q = \int \frac{f_1 X}{f_1 f_2' - f_2 f_1'} dx$$

$$\therefore \quad y = C_1 f_1 + C_2 f_2 + P \cdot I$$

Note: The Wronskian of f_1, f_2 of (i)

$$W = \begin{vmatrix} f_1 & f_1' \\ f_2 & f_2' \end{vmatrix} = f_1 f_2' - f_2 f_1'$$