

and eliminating C_1 from (12) & (13) gives

$$2y = 2C_1 e^{-2x} + 2C_2 e^{3x}$$

$$y' = -2C_1 e^{-2x} + 3C_2 e^{3x}$$

$$(11) \quad 2y + y' = 5C_2 e^{3x} \quad (16)$$

Comparing (16) & (15) we have,

$$y'' + 2y' = 15C_2 e^{3x} = 3(5C_2 e^{3x}) = 3(2y + y')$$

$$y'' + 2y' = 3(2y + y')$$

$$y'' + 2y' - 3y' - 6y = 0$$

$$y'' + y' - 6y = 0 \text{ is the required}$$

diff eqn.

Example 3: (Ex).

Find the diff eqn whose gen sol. is

$$y = C_1 e^{-x} + C_2 e^x$$