Department of Mathematics

KIIT Deemed to be University

Subject: Differential Equations & Linear Algebra

Subject Code: MA-11001

Assignment-I (2022-23)

Full Marks-05

Q.1) Eliminate the arbitrary constants from the following equations and obtain the differential equation [CO1]

$$e^{2y} + 2axe^{y} + a^2 = 0$$

Q.2) Solve the IVP by reducing to separable ODE. [CO1]

$$yy' = x^3 + \frac{y^2}{x}, y(2) = 6.$$

Q.3) The tank contains 1000 gal of water in which 200lb of salt are dissolved. Fifty gal of brine, each containing $(1 + cos\, t)$ lb of dissolved salt, run into the tank per minute. The mixture, kept uniform by stirring, runs out at the same rate. Find the amount of salt $y(t)$ in the tank at any time t. [CO2]

Q.4) Find an integrating factor and then find the particular solution. [CO1]

$$y' = xy + 2x - x^3, y(0) = 0$$

Q.5) Find an integrating factor and then solve. [CO1]

$$ydx - xdy + ln\, x\, dx = 0$$