Math-202 Semester-172 QUIZ III

NAME: S.No. ID:

Maximum Marks: 10 Section:18 Time Allowed: 35 minutes

(1) Verify that $y_1 = x,\ y_2 = x^2$ and $y_3 = \frac{1}{x}$ form a fundamental set of solutions of the DE $x^3y''' + x^2y'' - 2xy' + 2y = 0$. on the interval $(0, \infty)$.

(2) Find the largest interval centered about $x = 0$ for which the initial- value problem $(x-1)y'' + \ln(x+1)y = x,\ \ y(0) = 0, y'(0) = 1$ has a unique solution.

(3) Find the general solution of the DE on the interval $(0, \infty)$

$$xy'' - y' + 4x^3y = 0,$$

given that $y_1 = \sin(x^2)$ is a solution.