## QUIZ 5 - MATH 310 YOUR NAME:

Read each problem **very carefully** before starting to solve it. Each problem is worth 5 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. Consider the initial value problem

$$5y'' + 4y' + \frac{5}{4}y = 0, \quad y(0) = 10, \quad y'(0) = 0.$$

(a) Find the general solution of the differential equation and express it as a linear combination of a fundamental set of two **real-valued** solutions.

(b) Solve the given initial value problem.

2. Consider the second-order homogeneous differential equation with constant coefficients

 $4y'' + by' + 9y = 0 \quad (b \text{ is a real constant}).$ 

Determine the values of the constants b and r so that the functions  $y_1(t) = e^{rt}$  and  $y_2(t) = te^{rt}$  be both solutions of the given differential equation.