

Final Exam Topics (Total 400 points)

1. Old Material (100 points)

First Order Equations (2 problems)

- a. Integrating factor/ Separation
- b. Exactness
- c. Solutions by substitutions/Bernoulli Equations

Second Order Equations (1 problem)

- a. Reduction of Order
- b. Constant Coefficient using Undetermined Coefficients
- c. Variation of Parameters
- d. Euler-Cauchy Equations

2. Linear Models: Initial-value problems (50 points) (1 problem)

3. Laplace Transforms (150 points)(4 problems)

- a. Laplace transform and inverse Laplace transform
- b. Differential Equations
- c. Heaviside Functions
- d. Dirac Functions

4. Series Solutions (100 points) (2 problems)

- a. Power Series (no singular points)
- b. Method of Frobenius