Differential Equations
Mid Term Examination - II (Spring-2006)

MTH 2201

Duration: 1 hour Max. Credit: 25 points

1. Solve the Bernoulli DE \( y' - y = e^t y^2 \). [5]

2. Find the solution of the IVP: \( y'' + y' + y = 0 \), \( y(0) = 1 \), \( y'(0) = 0 \). [5]

3. Find a particular solution of the DE \( y'' + 9y = t^2 e^{3t} + 6 \), using the method of undetermined coefficients. [5]

4. Find a particular solution of the DE \( y'' + 4y' + 4y = t - 2e^{-2t} \), for \( t > 0 \). [5]

5. Let \( \phi_1(t), \phi_2(t) \) be two solutions of the DE \( y'' - y = 0 \), satisfying the initial conditions \( \phi_1(0) = 1 \), \( \phi_1'(0) = 1 \) and \( \phi_2(1) = 0 \), \( \phi_2'(1) = 1 \). Determine if these solutions \( \phi_1(t) \) and \( \phi_2(t) \) are linearly dependent or linearly independent. [5]