Ordinary Differential Equations-1

1.Ordinary Differential equations,major definitions.

2.Equations with the separated variables.

3.Equations reducible to equations with the separated variables.

4.Homogeneous equations.

5. Generalized homogeneous equations.

6.Fraction-linear equations (all cases).

7.Linear equation.Theorem (with the proof).

8.Properties of solutions of the Linear equation.

9.Bernoully equation.

10.Riccaty equation.

11. Properties of Riccaty equation.

12.Properties of solutions of Riccaty equation.

13.Special Riccaty equations.

14.The Cauchy-Peano theorem on existence and uniqueness of solution (all steps with the proof).

15.Euler broken.Lemma (without proof).

16.Arsela Theorem (without proof).

17.Peano Theorem on existence of solution (without proof).

18.Total (exact) differential equations (necessary condition).

19 .Total (exact) differential equation (sufficient condition).

20.Integrating factor.Theorem (with the proof).

21.Theorem 1 on the form of the Integrating factor (with the proof).

22.Theorem 2 on number of integrating factors (with the proof).

23.Finding of integrating factor if $\mu = \mu(x)$.

24.Finding of integrating factor if $\mu = \mu(y)$.

25.Equations not solved with respect to derivative.

26.Method of Discriminant curve.

27.Method of Envelope curve.

28.Non-complete differential equations.Type F(x,y')=0.

29.Non-complete differential equations.Type F(y,y')=0.

30.The General method of introduction of paramerer.

31.Lagrange equation.

32.Clero equation.

33.linearly independent system of functions.Definition.Examples.

34.Linearly dependent system of functions.

35.Wronsky determinant.Theorem (with the proof)/

36.Properties of Wronsky determinant.

37.Linear differential equations of the n-th order.

38.Properties of the Linear equation.

39.Properties of solutions of the linear equation.

40.Fundamental system of solutions.Theorem 1 (on existence).

41.Fundamental system.Properties.

42.Problem of trajectories.

43.Equations of form ($F(y^{(n)}, y^{(n-1)}) = 0$.

44.Equation of form $y^{(n)} = f(x)$.

45.Conditions for the countinuation of the solution of the Cauchy problem onto the entire interval.

46. Conditions for the non-countinuity of the solution of the Cauchy problem .