CONTENTS

INTRODUCTION

CHAPTER I

Linear Homogeneous equations of the *n*th order with coefficients whose variable parts consist of bounded functions when the roots of the corresponding characteristic equation have negative real parts.

§ 1. FUNDAMENTAL CONCEPTS AND NOTATIONS 1

§ 2. STABILITY OF THE SOLUTION WHEN $t \to +\infty$ 2

CHAPTER II

Linear Homogeneous equations of the *n*th order with coefficients whose variable parts are functions of the class $\sum$ when the roots of the corresponding characteristic equation have distinct real parts.

§ 1. PRELIMINARY COMMENTS AND NOTATIONS 6

§ 2. FORM OF THE FORMAL SOLUTION OF THE EQUATION 7

CHAPTER III

Asymptotic property of the approximate solution of the equation examined in Chapter II.

§ 1. ABOUT THE *m*-th APPROXIMATION 14

§ 2. GENERAL COMMENTS 15

§ 3. ESTIMATION OF ERROR IN THE *m*-th APPROXIMATION 15

CHAPTER IV

Asymptotic property of the approximate solutions with any form of roots of the characteristic equation.

§ 1. GENERAL COMMENTS 20

§ 2. NOTATIONS 21

§ 3. LEMMA ABOUT THE PROPERTIES OF MARTICES WHICH ARE INVOLVED WHEN EXAMINING THE "COMPLETE" TRANSFORMATION OF THE FUNDAMENTAL SYSTEM OF EQUATIONS 23

§ 4. THE "COMPLETE" TRANSFORMATION OF FUNDAMENTAL SYSTEM OF EQUATIONS 25

CHAPTER V

Evaluation of the error for the *m*-th approximation

§ 1. GENERAL COMMENTS 36

§ 2. CONCEPTION OF THE "CONTRACTED" TRANSFORMATION OF THE FUNDAMENTAL SYSTEM OF EQUATIONS 36

§ 3. THE "CONTRACTED" TRANSFORMATION OF THE EXAMINED SYSTEM OF EQUATIONS 37

§ 4. THE FORM OF THE *m*-TH APPROXIMATION OF THE SOLUTION OF THE FUNDAMENTAL SYSTEM OF EQUATIONS 39

§ 5. EVALUATION OF THE ERROR OF THE *m*-TH APPROXIMATION FOR THE LIMITING VALUES OF t 40

CHAPTER VI

Criteria of stability of the exact solution of the fundamental system of equations when $t \to +\infty$

§ 1. LEMMAS ABOUT THE PROPERTIES OF THE SYSTEM OF HOMOGENEOUS LINEAR DIFFERENTIAL EQUATIONS OF THE FIRST ORDER AND THE CORRESPONDING DETERMINANTS OF HURWITZ 46

§ 2. BEHAVIOUR OF THE EXACT SOLUTION OF THE SYSTEM AT INFINITY . 55

CHAPTER VII

Asymptotic property of the approximate solution of the fundamental system of equations

§ 1. PRELIMINARY COMMENTS 61

§ 2. EVALUATION OF THE ERROR OF THE *m*-TH APPROXIMATION 62

CHAPTER VIII

Criteria of the unstability of the solution of the fundamental system of equations

§ 1. LEMMA ABOUT THE RELATION BETWEEN THE REAL PARTS OF THE ROOTS OF THE CHARACTERISTIC EQUATION AND THE DETERMINANTS OF HURWITZ 63

§ 2. INFINITE SOLUTION OF THE FUNDAMENTAL SYSTEM OF EQUATIONS WHEN $t \to +\infty$ 73

CONCLUSION 76

Supplement

§ 1. INTRODUCTORY COMMENTS 77

§ 2. MATHIEU EQUATION 78

§ 3. CONDITIONS FOR THE STABILITY OF SOLUTIONS OF THE CORRESPONDING SYSTEM OF EQUATIONS 80

§ 4. MECHANICAL SIGNIFICANCE OF DERIVED CONDITION 86

§ 5. EXAMINATION OF THE "GENERALISED" MATHIEU EQUATION 87

Bibliography 92