COMBINED EXPANSIONS OF PRODUCTS OF SYMMETRIC POWER SUMS AND OF SUMS OF SYMMETRIC POWER PRODUCTS WITH APPLICATION TO SAMPLING[1]

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PREFACE

This article is divided into two parts. Part I has for its title "Combined Expansions of Products of Symmetric Power Sums and of Sums of Symmetric Power Products" and develops the general mathematical theory which is applied in Part II to "The Fundamentals of Sampling." Part II will appear in a latter issue of this journal.

Each part is treated as an organic unit and has its own introduction and bibliography. Each article is assigned a given number and each book is given a letter so that references can be indicated concisely in the body of the dissertation.

Each part is divided into chapters and sections. Braces are used to indicate the important formulas.

PART I. COMBINED EXPANSIONS OF PRODUCTS OF SYMMETRIC POWER SUMS AND OF SUMS OF SYMMETRIC POWER PRODUCTS

Introduction

The mathematical material which is presented here has proved useful in generalizing that portion of the fundamental theory of sampling in which relations are established between the moments of the sample and the moments of the parent population. It is the purpose to establish the theorems in algebraic form since they constitute an extension of partition and symmetric function theory and may be of value to someone not necessarily interested in sampling.

A great deal of work has been done in symmetric function theory but not much of this is of present value to the statistician. His problem deals with the "power sum" while the classical theory, for the most part, deals with the interrelations of elementary symmetric functions and monomial symmetric functions. Only one phase of the reasoning developed in this investigation seems to have received extensive consideration previously and that is the subject covered in Chapter III.

Previous authors have noted that much of symmetric function theory reduces, with a proper choice of notation, to partition theory. It is the plan of this treatise to present in Chapter I an outline of new partition theory which

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