

Contents

Preface	xi
Basic Notation and Numbering System	xiii
CHAPTER 1	
Introduction	1
1.1. Some Fundamental Properties	1
1.2. Historical Remarks	2
1.3. Characterization	3
1.4. Scope and Organization	3
CHAPTER 2	
The Bivariate Normal Distribution	6
2.1. Some Distribution Properties	7
2.2. The Distribution Function and Sampling Distributions	14
2.3. Dependence and the Correlation Coefficient	19
Problems	21
CHAPTER 3	
Fundamental Properties and Sampling Distributions of the Multivariate Normal Distribution	23
3.1. Preliminaries	23
3.2. Definitions of the Multivariate Normal Distribution	26
3.3. Basic Distribution Properties	30
3.4. Regression and Correlation	35
3.5. Sampling Distributions	47
Problems	59

CHAPTER 4	
Other Related Properties	62
4.1. The Elliptically Contoured Family of Distributions and the Multivariate Normal	62
4.2. Log-Concavity and Unimodality Properties	68
4.3. MTP_2 and MRR_2 Properties	73
4.4. Schur-Concavity Property	79
4.5. Arrangement-Increasing Property Problems	84 89
CHAPTER 5	
Positively Dependent and Exchangeable Normal Variables	91
5.1. Positively Dependent Normal Variables	92
5.2. Permutation-Symmetric Normal Variables	104
5.3. Exchangeable Normal Variables Problems	108 120
CHAPTER 6	
Order Statistics of Normal Variables	123
6.1. Order Statistics of Exchangeable Normal Variables	123
6.2. Positive Dependence of Order Statistics of Normal Variables	130
6.3. Distributions of Certain Partial Sums and Linear Combinations of Order Statistics	136
6.4. Miscellaneous Results Problems	140 147
CHAPTER 7	
Related Inequalities	150
7.1. Introduction	150
7.2. Dependence-Related Inequalities	152
7.3. Dimension-Related Inequalities	154
7.4. Probability Inequalities for Asymmetric Geometric Regions	161
7.5. Other Related Inequalities Problems	169 177
CHAPTER 8	
Statistical Computing Related to the Multivariate Normal Distribution	181
8.1. Generation of Multivariate Normal Variates	181
8.2. Evaluation and Approximations of Multivariate Normal Probability Integrals	186
8.3. Computation of One-Sided and Two-Sided Multivariate Normal Probability Integrals	193
8.4. The Tables Problems	194 199

CHAPTER 9

The Multivariate t Distribution	202
9.1. Distribution Properties	204
9.2. Probability Inequalities	207
9.3. Convergence to the Multivariate Normal Distribution	211
9.4. Tables for Exchangeable t Variables	213
Problems	216
References	219
Appendix—Tables	229
<i>Author Index</i>	261
<i>Subject Index</i>	265