

# Contents

Preface	v
<b>I Preliminaries</b>	<b>1</b>
1 Locally compact Abelian groups . . . . .	1
2 Probability distributions on locally compact Abelian groups . . . . .	11
<b>II Gaussian distributions on locally compact Abelian groups</b>	<b>19</b>
3 Properties of Gaussian distributions . . . . .	19
4 Cramér’s theorem on the decomposition of a Gaussian distribution on locally compact Abelian groups . . . . .	32
5 Polynomials on locally compact Abelian groups and the Marcinkiewicz theorem . . . . .	38
6 Gaussian distributions in the sense of Urbanik . . . . .	49
<b>III The Kac–Bernstein theorem for locally compact Abelian groups</b>	<b>56</b>
7 Locally compact Abelian groups for which the Kac–Bernstein theorem holds . . . . .	56
8 Random variables with values in the group $\mathbb{R} \times \mathbb{T}$ and in the $\mathfrak{a}$ -adic solenoid $\Sigma_{\mathfrak{a}}$ . . . . .	69
9 Gaussian distributions in the sense of Bernstein . . . . .	81
<b>IV The Skitovich–Darmois theorem for locally compact Abelian groups (the characteristic functions of random variables do not vanish)</b>	<b>92</b>
10 Locally compact Abelian groups for which the Skitovich–Darmois theorem holds . . . . .	92
11 Random variables with values in the two-dimensional torus $\mathbb{T}^2$ . . . . .	107
12 Random variables with values in the groups $\mathbb{R} \times \mathbb{T}$ and $\Sigma_{\mathfrak{a}} \times \mathbb{T}$ . . . . .	121
<b>V The Skitovich–Darmois theorem for locally compact Abelian groups (the general case)</b>	<b>133</b>
13 The number of random variables $n = 2$ . . . . .	133
14 The number of random variables $n \geq 3$ . . . . .	153
15 Random variables with values in the $\mathfrak{a}$ -adic solenoid $\Sigma_{\mathfrak{a}}$ . . . . .	172
<b>VI The Heyde theorem for locally compact Abelian groups</b>	<b>186</b>
16 The characteristic functions of random variables do not vanish . . . . .	186
17 Random variables with values in finite and discrete Abelian groups . . . . .	197
<b>Appendix. The Kac–Bernstein and Skitovich–Darmois functional equations on locally compact Abelian groups</b>	<b>223</b>

<b>Comments and unsolved problems</b>	<a href="#">237</a>
Bibliography	<a href="#">247</a>
Symbol index	<a href="#">253</a>
Subject index	<a href="#">255</a>