Contents

1	Prob	Probabilistic-Statistical Models in Quickest Detection			
	Prob	lems. Discrete and Continuous Time	1		
	1.1	The Stochastic θ -Model (Parametric Approach)	1		
	1.2	Stochastic G-Models (Bayesian Approach). Discrete Time	8		
	1.3	Stochastic θ - and G-Models. Continuous Time	10		
2	Basic Settings and Solutions of Quickest Detection Problems.				
	Discr	ete Time	13		
	2.1	Variants A, B, C and D. Formulations	13		
	2.2	Variant A. Reduction to Standard Form	15		
	2.3	The $\pi = (\pi_n), \varphi = (\varphi_n)$, and $\psi = (\psi_n)$ Statistics	18		
	2.4	Variant B, Generalizations. Reduction to Standard Form	25		
	2.5	Variant C. Reduction Inequality	31		
	2.6	Variant D. CUSUM-Statistics $\gamma = (\gamma_n)$	32		
	2.7	The Solution of Disorder Problems in Variant A	44		
	2.8	Approaches to the Solution of Disorder Problems in Variant B	50		
	2.9	Approaches to the Solution of Disorder Problems in Variant C	52		
	2.10	Approaches to the Solution of Disorder Problems in Variant D	53		
3	Optimal Stopping Times. General Theory for the Discrete-Time				
	Case		57		
	3.1	The Martingale Approach in the Case of a Finite Time			
		Horizon. Backward Induction Method	57		
	3.2	The Martingale Approach in the Infinite Time Horizon			
		Case. The Essential Supremum Method	64		
	3.3	Passage to the Limit in Finite-Horizon Models	71		
4	Optimal Stopping Rules. General Theory for the Discrete-Time				
		in the Markov Representation	75		
	4.1	Definition of Markov Sequences	75		
	4.2	The Finite Time Horizon Case $N < \infty$	77		

	4.3 4.4	The Infinite Time Horizon Case $N = \infty$ Examples	82 84			
5	Optimal Stopping Rules. General Theory					
	for th	e Continuous-Time Case	93			
	5.1	Standard and Nonstandard Optimal Stopping Rules	93			
	5.2	Considerations Concerning Continuous-Time				
		Optimal Stopping Problems and Their Connection				
		with Mathematical Analysis	95			
	5.3	The Theory of Optimal Stopping Rules. The Martingale				
		Approach	106			
	5.4	The Theory of Optimal Stopping Rules. The Markov				
		Approach	112			
	5.5	On Optimal Stopping Rules in the Case of Unbounded				
		Payoff Functions	119			
	5.6	Generalization to Nonhomogeneous Processes	124			
	5.7	The Theory of Optimal Stopping Rules. The				
		Markov Approach. The Mayer Terminal Functional				
		and the Lagrange Integral Functional	125			
(n (
6	Basic Formulations and Solutions of Quickest Detection					
		ems. Continuous Time. Models with Brownian Motion	139			
	6.1	The A, B, C, and D Variants in the Brownian Motion Case	139			
	6.2	Variant A. Reduction to Standard Form	141			
	6.3	Variant B. Reduction to Standard Form	158 165			
	6.4	Variant C. Reduction Inequalities	105			
	6.5	Variant D. Reduction Inequalities. Optimality	170			
	"	of the CUSUM Statistics γ	178			
	6.6	On the Quickest Detection Problem with Charge for the Carried Out Observations	192			
		for the Carried Out Observations	192			
7	Multi-stage Quickest Detection of Breakdown of a Stationary					
		ne. Model with Brownian Motion	217			
	7.1	Application of Wald's Method	217			
	7.2	Application of the Neyman-Pearson Method	227			
	7.3	Optimal Method in the Multi-stage Detection of Disorder				
		Occurring Against the Background of an Established				
		Stationary Observation Regime (Variant E)	233			
8	Disorder on Filtered Probability Spaces					
Ū	8.1	Disorder Problems with a Priori G-Distribution	207			
	0.1	of the Occurrence Time. Basic Formulas	239			
	8.2	Disorder Problems with a Priori Distribution G	4)			
	0.2	of the Occurrence Time. Bayesian Formulation	246			
	8.3	Disorder Problems in Variant A*	255			
	8.4	A Remark Concerning the Equivalence of the Problems	200			
	5.1	in Variants A and A*	267			

	8.5 8.6	Confidence Intervals in Disorder Problems for <i>G</i> -Models Sequential Estimation of the Drift Coefficient of a Fractal	269	
		Brownian Motion	271	
9	Bayes	sian and Variational Problems of Hypothesis Testing.		
	Brow	nian Motion Models	277	
	9.1	The Wald Problem and Comparison		
		with the Neyman-Pearson Method	277	
	9.2	A Sequential Procedure for Deciding Among Three		
		Hypotheses	294	
	9.3	Sequential Testing of Complex Hypotheses (Chernoff's		
		Problem). The Zhitlukhin-Muravlëv Method	315	
	9.4	Sequential Testing of Two Hypotheses (The Kiefer-Weiss		
		Problem)	326	
	9.5	Sequential Testing of Two Hypotheses (in the Two-Sided		
		Disorder Problem)	339	
10	Some	Applications to Financial Mathematics	367	
	10.1	Choosing the Optimal Time for Realizing a Stock Whose		
		Trend Is Subject to Disorder. I	367	
	10.2	Choosing the Optimal Time for Realizing a Stock Whose		
		Trend Is Subject to Disorder. II	375	
	10.3	The Russian Option	379	
Ref	References			
Ter	Term Index			
Not	Notation Index			