

ISO 28640:2010-03 (E)

Random variate generation methods

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Symbols and mathematical binary operations	2
4.1 Symbols	2
4.2 Mathematical binary operations	2
5 Uniformly distributed pseudo-random numbers	3
5.1 General	3
5.2 M-sequence method definition	3
5.3 Pentanomial GFSR method	4
5.4 Combined Tausworthe method	4
5.5 Mersenne Twister method	5
6 Generation of random numbers from various distributions	6
6.1 Introduction	6
6.2 Uniform distribution	6
6.3 Standard beta distribution	7
6.4 Triangular distribution	8
6.5 General exponential distribution with location and scale parameters	8
6.6 Normal distribution	9
6.7 Gamma distribution	9
6.8 Weibull distribution	11
6.9 Lognormal distribution	11
6.10 Logistic distribution	11
6.11 Multivariate normal random variate generation	12
6.12 Binomial distribution	12
6.13 Poisson distribution	14
6.14 Discrete uniform distribution	14
Annex A (informative) Table of physical random numbers	16
A.1 Table of random numbers	16
A.2 Method of physical random number generation	17
Annex B (informative) Algorithm for pseudo-random number generation	18
B.1 Program code for the trinomial GFSR method	18
B.2 Program code for the pentanomial GFSR method	22
B.3 Program code for the combined Tausworthe method	28
B.4 Program code for the Mersenne Twister method	32
B.5 Linear congruential method	38
B.6 Reference examples	52
Bibliography	53