



'সমানো মন্ত্র: সপিতি: সমানী'

UNIVERSITY OF NORTH BENGAL
B.Sc. Programme 4th Semester Examination, 2023

SEC1-P2-STATISTICS

MONTE CARLO METHOD

Time Allotted: 2 Hours

Full Marks: 60

The figures in the margin indicate full marks.

GROUP-A

1. Answer any **four** from the following: 3×4 = 12
- (a) What is simulation as an experiment?
 - (b) What is dynamic simulation models?
 - (c) What is combined generators?
 - (d) What is static simulation models?
 - (e) What is a Monte Carlo study?
 - (f) What are some typical situations where a Monte Carlo study is needed?

GROUP-B

2. Answer any **four** of the following: 6×4 = 24
- (a) Why is Monte Carlo simulation often necessary?
 - (b) Explain generating continuous random variables.
 - (c) Explain how to generate a random variable from p.d.f.
$$f(x) = 2x; 0 \leq x \leq 1$$
$$= 0; \text{ otherwise}$$
 - (d) Explain random number generation.
 - (e) Discuss the uses of the Monte Carlo method for correlated quantities.
 - (f) Write a note about multiple recursive generators.

GROUP-C

3. Answer any **two** questions from the following: 12×2 = 24
- (a) Discuss the classification of simulation method.
 - (b) Explain how to generate Gaussian distribution by Box-Muller method.
 - (c) Explain how to generate from the Beta(1, β) distribution using the inverse-transform method.
 - (d) Generate the binomial random variable from normal approximation.

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