Nature-Inspired Computing Midterm Exam

Question 1: (*35 points*) We wish to find the x_i values which minimize the function `f(x_i)`, `i=1,2,...,5` in the interval `(-2.28<x_i<1.20)`. Assume a binary representation for the individuals.
   a) Give an example individual and explain.
   b) What problems may be encountered in different stages of a GA due to the representation used? Explain.
   c) For this representation, what can be done to overcome the above problems?
   d) Which representation is more suitable for this problem? Why? Give an example individual.

Question 2: (*15 points*) What is the difference between "evolutionary strategies" and "genetic algorithms" based on when fitness information is used in the evolutionary process?

Question 3: (*15 points*) What is the difference between an objective function and an evaluation function?

Question 4: (*35 points*)
   a) Briefly define "stochastic local search".
   b) Briefly compare and contrast "probabilistic iterative improvement" and "simulated annealing" based on their key concepts.
   c) Match the two sides and explain why:
1. iterative improvement	a. intensification strategy
2. uninformed random walk	b. diversification strategy