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Courses » Computational Systems Biology

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# Unit 10 - Week 6

## Course outline

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**Week 6**

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46 - Genetic Algorithms

47 - Other Evolutionary Algorithms

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## Assignment 6

The due date for submitting this assignment has passed.

As per our records you have not submitted this assignment.

**Due on 2018-09-12, 23:59 IST.**

1) Genetic algorithms involve which of the following phenomena?

**1 point**

- ☐ Mutation
- ☐ Cross over
- ☐ Selection
- ☐ All of the above

**No, the answer is incorrect.****Score: 0****Accepted Answers:***All of the above*

2) Which of the following is not true about fitness functions?

**1 point**

- ☐ They perform similar role to an objective function
- ☐ Maximization of sum of squared residuals is an example of fitness function
- ☐ They help in optimization
- ☐ All of the above

**No, the answer is incorrect.****Score: 0****Accepted Answers:***Maximization of sum of squared residuals is an example of fitness function*

3) Which of the following statements are true about Simulated annealing:

**1 point**

- ☐ Works on the principle of Metropolis criterion
- ☐ A new step is accepted if the energy calculated at that step is decreased

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*A new step is accepted if the energy calculated at that step is decreased*  
*It is a probabilistic technique*

4) The accuracy of results obtained from Simulated Annealing depends on: **1 point**

- ☐ Temperature schedule
- ☐ Randomness of the search
- ☐ Initial conditions
- ☐ All of the above

**No, the answer is incorrect.****Score: 0****Accepted Answers:***All of the above*

5) Simulated annealing is based on the idea that all moves that minimize cost are accepted along with some moves with low probability that increase cost. Which of the following statements is/are TRUE? **1 point**

- ☐ Convergence depends on initial conditions
- ☐ Convergence doesn't depend on initial conditions
- ☐ This method helps escape local minima
- ☐ Always converges at global minima

**No, the answer is incorrect.****Score: 0****Accepted Answers:***Convergence depends on initial conditions**This method helps escape local minima*

Genetic algorithms are based on the biological evolution and frequently used for parameter estimation. Which of the following options best describes the description? (Q6- Q9)

6) Parameter space to be searched **1 point**

- ☐ Chromosomes
- ☐ Population
- ☐ Generation
- ☐ Colony

**No, the answer is incorrect.****Score: 0****Accepted Answers:***Population*7) Large changes in the parameter vector independent of other parameter vectors **1 point**

- ☐ Mutation
- ☐ Crossover
- ☐ Selection
- ☐ Macro-mutation

**No, the answer is incorrect.****Score: 0****Accepted Answers:***Macro-mutation*

8) Large changes in the parameter vector dependent on other parameter vectors

1 point

- ☐ Mutation
- ☐ Crossover
- ☐ Selection
- ☐ Macro-mutation

No, the answer is incorrect.

Score: 0

Accepted Answers:

Crossover

9) Small changes in the parameter vector independent of other parameter vectors

1 point

- ☐ Mutation
- ☐ Crossover
- ☐ Selection
- ☐ Macro-mutation

No, the answer is incorrect.

Score: 0

Accepted Answers:

Mutation

10) Which one of the following is the migration topology for the archipelago "archi" in the code below (Hint: Look at PyGMO documentation) 1 point

```
from PyGMO import *
prob = problem.schwefel(dim = 50)
algo = []
for i in range(1,9):
    algo.append(algorithm.de(gen=500,variant=i))
archi = archipelago()
for i in range(0,8):
    archi.push_back(island(algo[i],prob,20))
print min([isl.population.champion.f for isl in archi])

archi.evolve(20)
print min([isl.population.champion.f for isl in archi])
```

- ☐ None
- ☐ topology.ring()
- ☐ topology.fully\_connected()
- ☐ migration.unconnected()

No, the answer is incorrect.

Score: 0

Accepted Answers:

migration.unconnected()

