



Question 1 The four pillars of evolution are:

- Diversity, Heredity, Selection, Genotype
- Population, Adaptation, Selection, Diversity
- Selection, Generation, Improvement, Heredity
- Population, Diversity, Heredity, Selection

Question 2 Which statement is correct about genotype/phenotype and selection?

- Phenotype and genotype are not directly affected by selection
- Selection operates independently on the genotype and on the phenotype
- Selection operates on the phenotype, not directly on the genotype
- Selection operates on the genotype, not directly on the phenotype

Question 3 What are the main steps of generation cycles in evolutionary computation?

- Initialization, Evaluation, Selection, Reproduction
- Selection, Reproduction, Mutation, Generation
- Evaluation, Selection, Mutation, Diversity
- Evaluation, Selection, Reproduction, Mutation

Question 4 Which statement about natural evolution (NE) and artificial evolution (AE) is correct?

- In NE there is no difference between genotype and phenotype
- In AE it is not necessary to use a population
- The fitness is computed differently in NE and in AE
- NE and AE are both optimisation processes

Question 5 The genetic string 102010 has:

- length 3 and cardinality 3
- length 6 and cardinality 3
- length 6 and cardinality 2
- length 3 and cardinality 2

Question 6 Which genetic code represents a valid job schedule for a company where six different jobs must be organized in morning, afternoon, and night shifts?

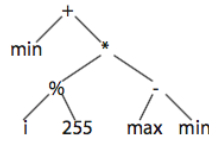
- 030303
- 010203
- 001012
- 123123

Question 7 Which genetic code represents a valid job schedule for a company where six different jobs must be organized in morning, afternoon, and night shifts?

- 001012
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Question 8 To which expression does this tree-based representation correspond?



- $\min + (255/i) * (\max - \min)$
- $\min * (i/255) * (\max - \min)$
- $\min + (i/255) * (\max - \min)$
- $\min + i/255 * \max - \min$

Question 9 In proportionate selection, what is the probability of reproduction p_i of an individual i with fitness f_i ?

- $p_i = \frac{f_i}{\sum_i N p_i}$
- $p_i = f_i$
- $p_i = \frac{f_i}{\sum_i N f_i}$
- $p_i = \frac{p_i}{f_i}$

Question 10 In proportionate selection, what is the probability of reproduction p_i of an individual i with fitness f_i ?

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Question 11 Which statement is true about tournament selection and selection pressure?

- Smaller tournament size generates stronger selection pressure
- Tournament of the best individuals generates the strongest selection pressure
- Larger tournament size generates stronger selection pressure
- Tournament size has no effect on selection pressure

Question 12 A fitness landscape is:

- A plot of the average and best population fitness
- A method to compare different evolutionary methods
- The distribution of fitness values for each possible combination of genes
- A measure of population diversity

Question 13 What is the correct relationship between population diversity and evolutionary progress in Artificial Evolution?

- Small population diversity is useful for evolutionary optimisation
- Reducing population diversity can prevent further evolutionary progress
- Population diversity has no effect on evolutionary progress
- Evolutionary progress is difficult if population diversity is too large



Question 14 What is best Evolutionary Algorithm (EA) for any type of problem?

- Competitive coevolution
- Genetic Algorithm
- There is no best EA for any type of problem
- Genetic Programming

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