Introduction to Soft Computing

Assignment 4

TYPE OF QUESTION: MCQ

Number of questions: 10 Total mark: 10 × 1 = 10

QUESTION 1: In GA operations fitness evaluation is performed after?

a. Decoding
b. Crossover
c. Mutation
d. Encoding

Correct Answer: d

Explanation: The detailed description can be found in Week 4 Lecture material – Page no. 3

QUESTION 2: In which GA operations the best individuals are selected?

a. Crossover
b. Mutation
c. Fitness evaluation
d. Encoding

Correct Answer: c

Explanation: Fitness evaluation is to evaluate the survivability of each individual in the current population and the next generation should be such that it is toward the (global) optimum solution. That is, to select the best individuals.

QUESTION 3:

Which crossover technique suffers from positional Bias?

a. Real crossover.
b. Order crossover.
c. Binary crossover.
d. All of the above.

Correct Answer: c

Explanation: The detailed description can be found in Week 4 Lecture material – Page no. 108.

QUESTION 4: Which selection strategy used the concept of elitism?

a. Canonical selection.
b. Tournament selection.
c. Rank-based selection.
d. Steady-state selection.

Correct Answer: d

Explanation: The detailed description can be found in Week 4 Lecture material- Page No. 67.

QUESTION 5:

Which encoding scheme is applicable to solve floor planning problem?

a. Real value encoding.
b. Binary encoding.
c. Tree encoding.
d. None of the above.

Correct Answer: c

Explanation: The detailed description can be found in Week 4 Lecture video 17.

QUESTION 6: Which of the following is true about Roulette-wheel selection strategy?

a. Convergence rate is slow
b. An individual may be selected more than once
c. Guaranteed to reach the global optimal solution
d. The probability for an individual is being selected in the mating pool is considered to be inversely proportional to its fitness.

Correct Answer: b

Explanation: The detailed description of the Roulette-wheel selection strategy can be found in Week 4 Lecture material page number 40-52.

QUESTION 7: In ranked based selection scheme, individuals are ranked according to?

a. Ascending order of their fitness values.
b. Descending order of their fitness values.
c. Any order of their fitness values.
d. None of the above.

Correct Answer: c
Explanation: The detailed description can be found in Week 4 Lecture material – Page no. 55.

QUESTION 8: Which of the following is a possible offspring when Uniform crossover is performed utilizing a crossover mask between the parents give below?

Parent 1: [0 0 1 0 1]
Parent 2: [0 0 1 1 1]
Mask: [1 1 1 0 1]

a. [0 0 0 0 0]
b. [1 1 1 1 0]
c. [0 0 1 1 1]
d. [1 1 1 0 1]

Correct Answer: c
Explanation: When there is a 1 in the mask, the gene is copied from Parent 1, else from Parent 2. The detailed description can be found in Week 4 Lecture material – Page no. 96.

QUESTION 9: Generation gap (G_p) is de fined as ? (Consider N is the population size and p is the number of individuals that will be replaced)

a. $G_p = \frac{p}{N}$

b. $G_p = \frac{N}{p}$

c. $G_p = p \times N$

d. $G_p = p^N$

Correct Answer: a

Explanation: $G_p = \frac{p}{N}$. The detailed description can be found in Week 4 Lecture material – Page no. 74

QUESTION 10: Given below two parents and the crossover point indicated by the black line, which of the following will be an off-spring of single point crossover?

Parent 1	1	0	1	1	0	0
Parent 2	0	1	1	0	0	1

a. [1 1 1 1 0 1]

b. [0 0 0 0 1 0]

c. [1 1 0 1 0 1]

d. [1 0 1 0 0 1]

Correct Answer: d

Explanation: The detailed description can be found in Week 4 Lecture material – Page no. 86.

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