Soft Computing & Optimization Algorithms [Multiple Choice Question] **UNIT No-04**

Name of Content: Basic Evolutionary Processes, EV: A Simple Evolutionary System

01 The tendency of population to remain in genetic equilibrium may be disturbed by

Option A Random mating

Option B Lack of migration

Option C Lack of mutations

Option D Lack of random mating

Correct Answer D

02 One of the important consequences of geographical isolation is:

Option A Random creation of new species

Option B No change in the isolated fauna

Option C Preventing Speciation

Option D Speciation through reproductive isolation

Correct Answer D

03 What is meant by the term Darwin fitness?

Option A The ability to survive and reproduce

Option B High aggressiveness

Option C Healthy appearance

Option D Physical strength

Correct Answer A

04 Diversification in plant life appeared:

Option A Due to abrupt mutations

Option B Suddenly on earth

Option C By seed dispersal

Option D Due to long periods of evolutionary changes

Correct Answer D

05 Chemical reactions could have converted simple organic compounds into _____ for the origin of life

Option A Micromolecules

Option B Nitrogen, oxygen and other gases

Option C Cells

Option D Macromolecules

Correct Answer D

06 Which one of the following sequences was proposed by Darwin and Wallace for organic evolution?

Option A	Overproduction, variations, constancy of population size, natural selection
Option B	Variations, constancy of population size, overproduction, natural selection
Option C	Overproduction, constancy of population size, variations, natural selection
Option D	Variations, natural selection, overproduction, constancy of population size

Correct Answer **C**

07 _____ is a subset of evolutionary computation,[1] a generic population-based meta-heuristic optimization algorithm

Option A	Genetic Algorithm
Option B	Evolutionary algorithm (EA)
Option C	Simulated Annealing
Option D	Artificial Intelligence

Correct Answer **B**

08 An EA uses mechanisms inspired by biological evolution, such as

Option A	mutation
Option B	recombination
Option C	selection
Option D	All of the above

Correct Answer **D**

09 Genetic Algorithms are

Option A	a class of algorithms that try and build solutions by introducing evolution and selection of the best in a population of candidate solutions
Option B	Methods, based on the theory of natural selection and evolutionary biology, for solving optimization problems.
Option C	A heuristic search method used in artificial intelligence and computing.
Option D	All of the above

Correct Answer **D**

10 Objects forming possible solutions within the original problem context are referred to as

Option A	Phenotypes
Option B	Genotypes
Option C	Genes
Option D	Chromosomes

Correct Answer **A**

Name of Content: Canonical Evolutionary Algorithms

01 In Evolutionary algorithm, An individual consist of

Option A Genotype and phenotypes

Option B Parent selection and crossover

Option C Genotype and a fitness function

Option D Mutation and recombination

Correct Answer C

02 Evolutionary Strategies were developed in the sixties by

Option A John Holland

Option B Rechenberg and Schwefe

Option C Allen and Karjalainen

Option D Ryan and Collins

Correct Answer B

03 EA heuristic follows

Option A Initialization

Option B Evaluation

Option C Mutation and selection

Option D All of the above

Correct Answer D

04 Selection is based on

Option A Ranking of the individual fitness

Option B Recombination of parents

Option C Mutation of parameter

Option D None of the above

Correct Answer A

05 The Simple evolution strategy operates on population of size two:

Option A The current point (parent)

Option B Result of its mutation (one offspring)

Option C Both a and b

Option D None of the above

Correct Answer C

06 Depending on search space & objective function, recombination & mutation of strategy parameter may or may not occur in specific algorithm

Option A True

Option B False

Correct Answer A

Name of Content: A Unified view of Simple EAs

01 EA consist of following elements

Option A Parent Population size

Option B Survival selection method

Option C Parent selection method

Option D All of the above

Correct Answer D

02 _____which of the following method determines to be kept in the next generation

Option A Parent selection

Option B Mutation

Option C Recombination

Option D Survival selection

Correct Answer D

03 Roulette wheel selection scheme is preferable when

Option A Fitness values are uniformly distributed

Option B Fitness values are non-uniformly distributed

Option C Needs low selection pressure

Option D Needs high population diversity

Correct Answer A

04 A genetic operator used in genetic algorithms for selecting potentially useful solutions for recombination.

Option A Fitness proportionate selection

Option B Roulette wheel selection

Option C Rank selection method

Option D Stochastic universal sampling

Correct Answer A & B

05 _____ is a method of selecting an individual from a population of individuals in a genetic algorithm.

Option A Roulette wheel selection

Option B Rank selection method

Option C Tournament selection

Option D Stochastic Universal Sampling

Correct Answer C

06 As selection pressure increases, fitter solutions are more likely to survive

Option A True

Option B False

Correct Answer A

07 What are normally the two best measurement units for an evolutionary algorithm?

Option A	Number of evaluations
Option B	Number of generations
Option C	Elapsed & CPU time
Option D	Both a & b
Correct Answer	**D**

08 What is most important to be concerned with in the evolution of repetitive problems?

Option A	Do multiple runs until a good solution is found
Option B	Execute one run until the solution is good enough
Option C	Get a reasonably good solution every time
Option D	Get a very good result just once
Correct Answer	**C**

09 Evolutionary Strategies (ES)

Option A	(μ,λ): Select survivors among parents and offspring
Option B	(μ+λ): Select survivors among parents and offspring
Option C	(μ-λ): Select survivors among offspring only
Option D	(μ:λ): Select survivors among offspring only
Correct Answer	**B**

10 Rank based selection

Option A	Use relative rather than absolute fitness
Option B	Use absolute rather than relative fitness
Option C	Results in less control of the selection pressure than fitness-proportionate selection
Option D	Ranking can be either linear or non-linear
Correct Answer	**A & D**