

Name:

Roll No.:

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School of Information Technology
Indian Institute of Technology Kharagpur
IT60108: Soft Computing Applications
Class Test - III

Full Marks: 20

Session 2014 – 2015

Time: 20 minutes

1. Which of the following statement(s) is(are) not true.
 - (a) GA is an optimization technique
 - (b) GA is a probabilistic search technique
 - (c) GA always gives optimal solution
 - (d) For a problem if there is more than one optimal solutions, GA outputs all the solutions

2. GA algorithm is effective to solve only
 - (a) single objective optimization problems
 - (b) mixed integer programming problem
 - (c) optimization problems involved with discrete(integer) variables
 - (d) optimization problems involved with continuous (integer/real) variables

3. In Simple GA (SGA), which is/are not allowed.
 - (a) Repetition in the individual selected for mating pool
 - (b) Population sizes in each generations are to be varied
 - (c) Overlapping generations
 - (d) Two or more individuals with same fitness value

4. In the context of Simple GA(SGA), the convergence rate will increase, if
 - (a) the size of mating pool(N_p) is comparable to that of the population size (N)
 - (b) from the mating pool of size (N_p), if we create N offspring to be replaced all individual in the current population
 - (c) from the mating pool of size (N_p), if we replace a large number of offspring and only N_p worst individuals in the current population of size N
 - (d) select N_p best individuals for mating to produce N individual for the next generation

5. In the context of Steady-State GA (SGA), which of the following statement(s) is/are true.
- (a) Generation gap is small
 - (b) Convergence rate is high
 - (c) Gives better result than the Simple GA (SGA)
 - (d) It is susceptible to stagnation
6. If we compare SGA and SSGA, then
- (a) the time for single iteration in SGA is more than in SSGA
 - (b) overall time of termination in SGA is more than in SSGA
 - (c) population diversity in SGA is far better than that of SSGA
 - (d) selection pressure in SGA is more than that of SSGA
7. Which of the following cannot be considered as a convergence criterion.
- (a) There is no significant change in the average fitness value for an successive generations
 - (b) The execution of GA elapsed a pre-specified time T
 - (c) p percentage of N (where p is some positive constant and N is the size of the population) individuals are with the same fitness values
 - (d) Fitness values of all individuals are above than a certain threshold value
8. Which of the following statement is true.
- (a) Binary coded GAs are faster than the real-coded GAs
 - (b) Binary coded GAs are accurate than the real-coded GAs
 - (c) All optimization problems can be encoded with binary-coded GA
 - (d) All GA parameters, which are applicable to binary-coded GA is also applicable to Order-GA
9. The length of chromosomes in binary-coded GAs, is decided by
- (a) number of design variables
 - (b) range of values of design variables
 - (c) objective functions
 - (d) constraints
10. Which of the following is/are not valid chromosomes in order GA?

- (a)

1	0	0	1	1	0	0	1
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- (b)

1	3	5	7	2	4	6	8
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- (c)

A	B	D	E	A	F	H	G
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- (d)

14.6	-23.4	177.23
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11. Out of the following crossover techniques which does not suffer(s) from "end point" problem.
 - (a) Single point crossover
 - (b) Uniform crossover
 - (c) Shuffle crossover
 - (d) Multi-point crossover

12. State whether the following statements are true or false.
 - (a) The most expensive operation in GA is the selection of individual for mating pool creation
 - (b) Mutation operation is not mandatory in any GA-based problem solving
 - (c) The number of GA loop will increase if the population size is increased
 - (d) Even we can implement Simple GA(SGA) without performing selection operation

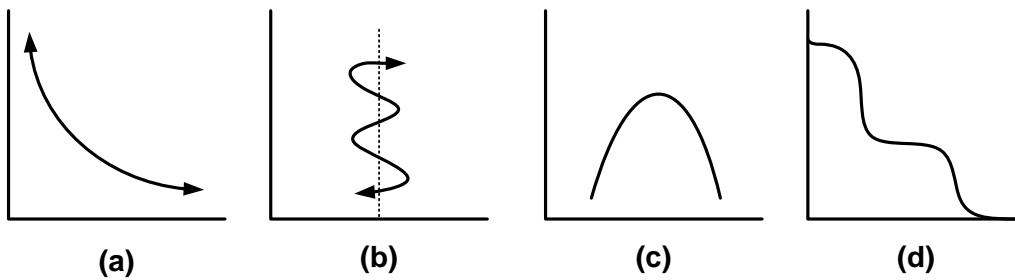
13. The purpose of the fitness evaluation operation is
 - (a) to check whether all individual satisfies the constraints given in the problem
 - (b) to decide the termination point
 - (c) to select the best individuals
 - (d) to identify the individual with worst cost function

14. Average fitness calculation can be used to
 - (a) understand whether the optimal solution(s) has been achieved
 - (b) termination of GA execution
 - (c) generation gap between two successive GA iteration
 - (d) whether the problem has been struck at local optima or not

15. Roulette-Wheel selection scheme is preferable when
 - (a) fitness values are uniformly distributed
 - (b) fitness values are non-uniformly distributed
 - (c) needs low selection pressure
 - (d) needs high population diversity

16. Which of the following statement is true in case of Rank-based selection scheme.
 - (a) Low population diversity, high selection pressure
 - (b) Low population diversity, low selection pressure
 - (c) High population diversity, low selection pressure
 - (d) High population diversity, high selection pressure

17. High selection pressure is desirable, when we need
- (a) faster termination of the GA
 - (b) near optimal solution
 - (c) there is no improvement in successive GA iteration
 - (d) fitness values are non-uniformly distributed
18. Tournament selection scheme is more preferable when
- (a) population are with very diversified fitness values
 - (b) when fitness values are uniformly distributed
 - (c) when fitness values are not necessarily uniformly distributed
 - (d) under all the above situations
19. To make the G_p (generation gap) a large value in Steady-state selection strategy, which of the following can be considered
- (a) selection of individual according to their fitness values and replacement at random
 - (b) selection of individual at random and replacement according to the inverse of their fitness values
 - (c) selection of both parents and replacement according to the inverse values of their fitness values
 - (d) all of the above
20. In the following graphs, how an objective function(along y -axis) varies with input parameter(along x -axis) are shown. In which case(s), there is(are) no optimal solution(s) exist(s)?



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