

## ECE 559 Final Exam Summer 06

1. Which of the following selection methods has the highest selection pressure?
  - (b) roulette wheel
2. Which type of recombination uses more than 2 parents?
  - (c) panmictic
3. **dropped**
4. Elitism isn't used in the  $(\mu, \lambda)$  ES
  - (a) TRUE
5. Which EA uses tournament outcomes to determine which individuals survive to become parents in the next generation?
  - (c) EP
6. Which of the following helps to maintain population diversity?
  - (a) niching

7. Which of the following EAs does not use mutation as a primary variation operator?
- (a) GA
  - (d) GP

**I'll accept either of the two above answers**

8. GP uses what type of genotype structure?
- (d) tree
9. Penalty functions are used
- (b) in constrained optimization problems
10. The most common form of strategy parameter adaption in the ES is
- (a) lognormal
11. A Pareto optimal search relies on
- (d) dominance checks
12. When it is likely that one or two individuals are highly fit, with respect to the rest of the population, rank-based selection is preferred over roulette-wheel selection.
- (a) TRUE
13. Let  $P_c$  be the probability of crossover and  $P_m$  the probability of mutation in a GA. Then  $P_c + P_m$  must equal 1.0.
- (b) FALSE

14. A GA without recombination is guaranteed to find the global optimum if allowed to run for a sufficient number of generations.
  - (a) TRUE
15. A solution to an optimization population is called
  - (c) a phenotype
16. A GA's population is split into sub-populations which evolve independently. This is called
  - (d) an island model GA
17. Stochastic universal sampling is frequently used in EP
  - (b) FALSE
18. Only a small number (say 10%) of the population is replaced in a
  - (a) steady-state GA
19. A GA augmented with a local search method is called
  - (d) a memetic algorithm
20. A GA is good at exploitation but rather poor at exploration.
  - (b) FALSE