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NPTEL

Courses » **Selected Topics in Decision Modeling**

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Unit 9 - Week 8

Course outline

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● Lecture 36 : Simulated Annealing

○ Lecture 37 : Tabu Search

● Lecture 38 : Particle Swarm Optimization

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● Lecture 40 : NSGA-II Examples

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Assignment Solution

Week 8 Assignment 8

The due date for submitting this assignment has passed.   **Due on 2018-10-03, 23:59 IST.**
As per our records you have not submitted this assignment.

1)   *1 point*

Simulated Annealing is a hill climbing method that:

    i.   Allows uphill movement only
    ii.   Allows both uphill and downhill movements
    iii.   Allows downhill movement only
    iv.   None of the above

○ i.

○ ii.

○ iii.

○ iv.

No, the answer is incorrect.
Score: 0

Accepted Answers:
ii.

2)   *1 point*

Simulated Annealing is used to minimize a function $f(x)$. For the initial point, the function value was $f1$. After 1st iteration, the function value for the new point is $f2$. It is found that is greater than $f1$.

    i.   The new point should be accepted readily
    ii.   The new point should be rejected readily
    iii.   Metropolis criterion is required to accept or reject the new point
    iv.   Newton's criterion is required to accept or reject the new point

○ i.

○ ii.

○ iii.

○ iv.

No, the answer is incorrect.

The value of Boltzmann's Constant K in Simulated Annealing is usually taken as:

    i.   K = 0
    ii. K = 1
    iii. K = 2
    iv. K is function of Temperature T

  ○ i.

  ○ ii.

  ○ iii.

  ○ iv.

No, the answer is incorrect.
Score: 0

Accepted Answers:
ii.

4)　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　*1 point*

Three main strategies in the Tabu Search technique are:

    i.   Forbidding strategy, Freeing strategy, and Short-term strategy
    ii. Forbidding strategy, Freeing strategy, and Aspiration level strategy
    iii. Freeing strategy, Short-term strategy and Aspiration level strategy
    iv. None of the above

  ○ i.

  ○ ii.

  ○ iii.

  ○ iv.

No, the answer is incorrect.
Score: 0

Accepted Answers:
i.

5)　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　*1 point*

A set of activities are to be sequenced so as to maximize total utility of the activities. Starting from an initial sequence, the activities are being swapped repeatedly to arrive at the best possible solution with the help of Tabu search. Some swaps are kept in the Tabu from time to time. This is done to ensure that:

    i.   Neighbourhood search is possible
    ii. Sequential search is possible
    iii. Problem size is manageable
    iv. Reversal to previous solution and being trapped in local optimum is prevented

  ○ i.

  ○ ii.

  ○ iii.

  ○ iv.

No, the answer is incorrect.
Score: 0

Accepted Answers:
iv.

6)   *1 point*

A set of activities are to be sequenced so as to maximize total utility of the activities.
Starting from an initial sequence, the activities are being swapped repeatedly to arrive a
the best possible solution with the help of Tabu search. Some swaps are kept in the Tabu
from time to time. Now:

    i.   The Tabu list is permanent
    ii.   The Tabu list is temporary and only for the next iteration
    iii.   The moves in Tabu list usually have a Tabu tenure of a number of iterations
    iv.   The Tabu list keeps changing within a given iteration

  ○ i.

  ○ ii.

  ○ iii.

  ○ iv.

No, the answer is incorrect.
Score: 0

Accepted Answers:
iii.

7)   *1 point*

In Particle Swarm Optimization, each particle accelerates towards:

    i.   Best position found by it so far (pbest)
    ii.   Global best postion found so far (gbest)
    iii.   Either pbest or gbest
    iv.   Both pbest and gbest

  ○ i.

  ○ ii.

  ○ iii.

  ○ iv.

No, the answer is incorrect.
Score: 0

Accepted Answers:
iv.

8)   *1 point*

In Particle Swarm Optimization, a number of particles are considered. These particles are

    i.   Initially dispersed, with every iteration they converge
    ii.   Initially converged, with every iteration they disperse further
    iii.   Intially dispersed, with every iteration they disperse further
    iv.   Intially converged, with every iteration they remain converged

  ○ i.

  ○ ii.

  ○ iii.

  ○ iv.

No, the answer is incorrect.
Score: 0

Accepted Answers:
i.

9)   *1 point*

In Particle Swarm Optimization, which of the following is a control parameter?

    i.   Position of the particle
    ii. Velocity of the particle
    iii. Maximum number of iteration
    iv. Acceleration coefficient (C1 & C2)

○ i.

○ ii.

○ iii.

○ iv.

No, the answer is incorrect.
Score: 0

Accepted Answers:
iv.

10)   *1 point*

A set of Pareto optimal solution are generated in a multi-objective optimization problem because of:

    i.   Similar nature of objective functions
    ii. Conflicting nature of objective functions
    iii. Nature of objective functions not important
    iv. None of the above

○ i.

○ ii.

○ iii.

○ iv.

No, the answer is incorrect.
Score: 0

Accepted Answers:
ii.

11)   *1 point*

Six Project Options are considered for completing a project in minimum possible time a minimum possible cost. Find the non-dominated solutions from the list given below:

Project Options	Time	Cost
A	90	60
B	87	60
C	85	70
D	78	75
E	78	80
F	72	86

    i.   A, B, C, F
    ii. A, C, E, F
    iii. B, C, E, F
    iv. B, C, D, F

○ i.

    ◯ ii.

    ◯ iii.

    ◯ iv.

No, the answer is incorrect.
Score: 0

Accepted Answers:
iv.

12)   *1 point*

Consider Question 11. Which of the following is true?

    i.   A dominates B and E dominates D
    ii.   B dominates A and D dominates E
    iii.   A dominates B and D dominates E
    iv.   B dominates A and E dominates D

    ◯ i.

    ◯ ii.

    ◯ iii.

    ◯ iv.

No, the answer is incorrect.
Score: 0

Accepted Answers:
ii.

13)   *1 point*

The process of preserving some parent solutions for next generation is called

    i.   Diversity preserving mechanism
    ii.   Elitism principle
    iii.   Crowding comparison
    iv.   None of the above

    ◯ i.

    ◯ ii.

    ◯ iii.

    ◯ iv.

No, the answer is incorrect.
Score: 0

Accepted Answers:
ii.

14)   *1 point*

In NSGA-II, demarcation of same rank solutions is done with the consideration of:

    i.   Higher crowding distance
    ii.   Lower crowding distance
    iii.   Medium crowding distance
    iv.   Elitism principle

    ◯ i.

    ◯ ii.

    ◯ iii.

○ iv.

No, the answer is incorrect.
Score: 0

Accepted Answers:
i.

15)   *1 point*

    In NSGA-II, crowding distance of the extreme solutions will be:

       i.   0
      ii.   1
     iii.   Infinity
     iv.   Cannot be predicted

○ i.

○ ii.

○ iii.

○ iv.

No, the answer is incorrect.
Score: 0

Accepted Answers:
iii.

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