

31 + 28.5 + 3 bonus m-clot

1. It's appropriate <sup>+3.5</sup> a reasonable time <sup>we heuristics, to want to solved in</sup> using exact methods. <sup>?</sup>
2. When the problem have variables <sup>+3.5</sup> polynomials so the time to take to solve the problem take too much time.
3. Yes, the problem that you can solve using <sup>+4</sup> exact algorithms. <sup>such as?</sup>
4. Usually it's designed to build feasible solutions <sup>+5</sup> but always not guarantee optimality.
5. It's a method that builds a solution step <sup>+4.5</sup> by step. You can start with nothing, or with a partial solution, adding complements until the feasible solution is complete.

Q: <sup>+4</sup> Start with a initial solution and explores the neighborhood, always finding better solution.

7. The 2-OPT heuristic its a method that work <sup>+4.5</sup> by exchanging two edges to reduce the total tour length. In each interaction, two edges are selected, removed, and the affected nodes are reconnected in different way that reduces the total distance.

8- You can use different ways to know which one is better, one of them is the solution value for the objective function.   
 +2 measure the objective function value for the solution obtained each here.

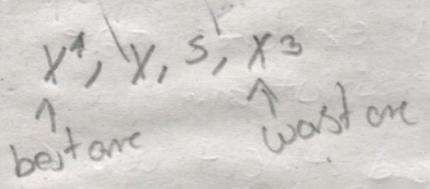
Section (2 Problems)

Q:

+5 a) Yes, it's a feasible solution because each element of the set  $V = \{1, 2, \dots, n\}$  is included in one of the subsets and there are no overlaps.   
 7 is missing

+6 b) Yes, it's a feasible solution each element of  $V$  is included in only one subset

+2 c)  $X = B = (\{1, 5, 9\}, \{2, 4, 6, 8, 10\}, \{3, 7\}) = 150$   
 $X + 0 = (\{2, 5, 9\}, \{1, 3, 4, 8\}, \{6, 10\}) = 130$   
 $X + 5 = (\{1, 3, 7\}, \{2, 5, 10\}, \{4, 6, 9\}) = 140$



d)

d) Findy clusters  $C(1)$   $C(2)$   $C(3)$

+8

For each object  $i$  in  $V$ : select the cluster with the smallest increase in dissimilarity if the object is added

Voive

Add the object to that cluster

Return clusters  $C(1)$   $C(2)$   $C(3)$

That's probably the way that probably I do it.

e) +0

f) Start with +8

1st. start with an initial feasible solution  $(X)$ . This solution consists of  $p$  clusters each containing a subset of the  $n$  objects

2nd. For each object in each cluster evaluate moving the object to another cluster.

3- If the move improves the total dissimilarity make the move

4- Repeat until no further improvement are found.

g) +0