Assignment 1

1. For Constraint Satisfaction Problems, the search strategy which would work good is DFS as there are no costs involved so no role of heuristic function. Also the tree obtained from it would be finite and has no cycles hence DFS would be better than BFS for this. If a node violates constraints in case of DFS, backtrack rather than continuing search.

2. If MRV (Minimum Remaining Value) heuristic has a tie-breaker type situation, then it is broken by choosing/assigning to a variable that imposes the maximum constraints on the remaining variables.

3. In case of inconsistency, backtracking search would fail causing the previous call not the recent value to try another value.

Assignment 2

1. For knapsack problems with weight W and items weight w_i and value v_i then the constraints would be

   Maximise the value in the knapsack. This would be the objective function

   Total capacity (W) individual items with weight w_i so

   $$\sum_{i=1}^{n} w_i \leq W$$

   $$\text{Max}(v_i) \qquad (i=1, \ldots n)$$

This follows 0-1 Knapsack

For fractional knapsack, the ratio of value to weight (v_i/w_i) would be our objective function as it has to be maximised.

So in knapsack, a fraction of the item would be included based on the above ratio obtained.