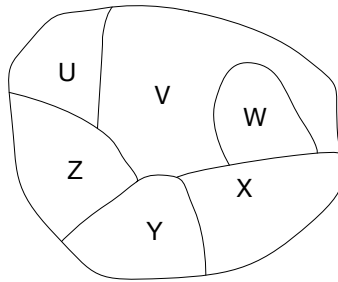
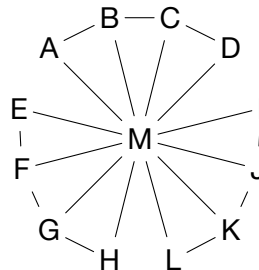


2. (a) Explain the following heuristics, and how they are used in a backtracking search.
- minimum remaining values,
 - degree heuristic, and
 - least constraining value.
- [6]

- (b) Consider the CSP below in which $\{U, V, W, X, Y, Z\}$ are variables that should be assigned a frequency f such that $f \in \{low, medium, high\}$, with the constraint that adjacent regions must not be assigned the same frequency.



- Draw a constraint graph for this problem.
 - Use the backtracking algorithm with appropriate heuristics to find a solution to this problem. Show all the steps carried out by the algorithm.
- (c) Explain how cutset conditioning could be used in the following constraint graph to make the search more efficient, and state the upper bound on the number of nodes expanded with and without cutset conditioning. Assume that each variable has the same domain, which is of size 5.
- [6]



- (d) Describe the operation of a simulated annealing search.
- [4]