Start with an undirected graph $G = (V, E)$ and a set of n colours, which represent the parts for which we are arranging, with each being an independent set. Denote $x_{v,i}$ to be a binary variable such that

$$x_{v,i} = \begin{cases} 1 & \text{if vertex } v \text{ is colour } i \\ 0 & \text{otherwise} \end{cases} ,$$

which requires nV variables. The energy is

$$H = H_A + H_B + H_C + H_D \,.$$

Each vertex is coloured exactly once:

$$H_A = A \sum_{v \in V} \left(1 - \sum_{i=1}^{n} x_{v,i} \right)^2$$

Vertices of the same colour are not connected by an edge:

$$H_B = B \sum_{(u,v) \in E} \sum_{i=1}^{n} x_{u,i} x_{v,i}$$

Maximise the weighting of selected vertices:

$$H_C = -C \sum_{v \in V} \sum_{i=1}^{n} W_v x_{v,i}$$

Maximise the weighting of included edges:

$$H_D = -D \sum_{(u,v) \in E} W_{uv} \sum_{i=1}^{n} \sum_{j=1}^{n} x_{u,i} x_{v,j}$$

It can be seen that for $n = 1$ this reduces to the MIS problem. For a score with p parts, it will be impossible to colour the graph exactly with $n < p$; the parameter A should be small enough to allow for some vertices to remain uncoloured. The lowest energy solutions will return coloured independent subsets of G that each represents a monophonic part of the final arrangement.