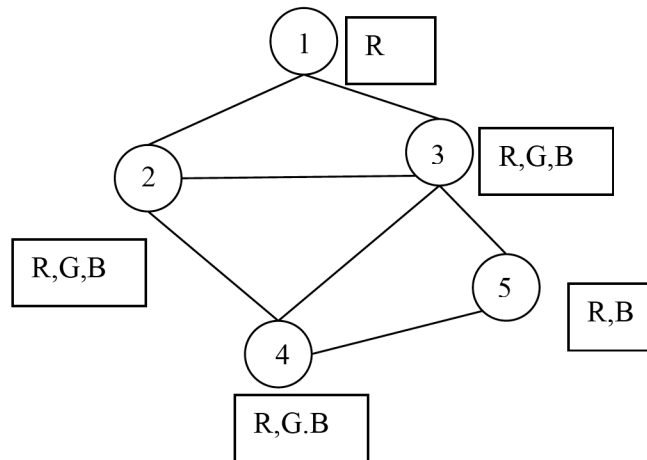


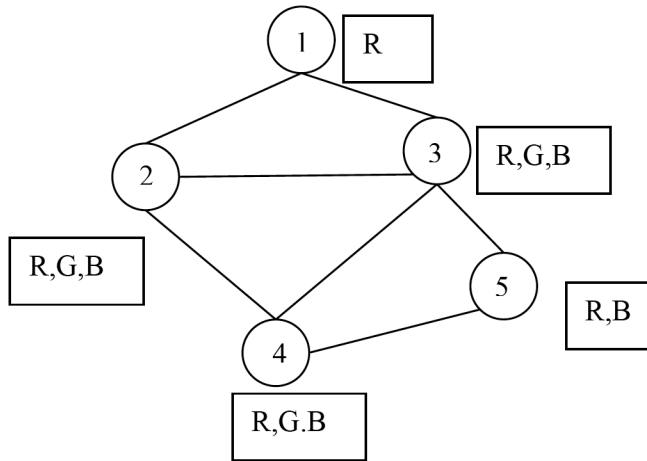
Problem 5: CSP (15 points)

Consider the following constraint graph for a graph coloring problem (the constraints indicate that connected nodes cannot have the same color). The domains are shown in the boxes next to each variable node.



1. What are the variable domains after a full constraint propagation?

- 1 = {R}
- 2 = {G, B}
- 3 = {G, B}
- 4 = {R, G, B}
- 5 = {R, B}



2. Show the sequence of variable assignments during a pure backtracking search (do not assume that the propagation above has been done), assume that the variables are examined in numerical order and the values are assigned in the order shown next to each node. Show assignments by writing the variable number and the value, e.g. 1R. **Don't write more than 10 assignments, even if it would take more to find a consistent answer.**

1R 2R 2G 3R 3G 3B 4R 5R 5B 4G [4B 2B 3R 3G 4R 5R 5B]

3. Show the sequence of variable assignments during backtracking with forward checking, assume that the variables are examined in numerical order and the values are assigned in the order shown next to each node. Show assignments by writing the variable number and the value, e.g. 1R.

1R 2G 3B 4R 2B 3G 4R 5B