Name $\qquad$ Discrete II, 2/24/2016, Quiz 2

1) List all 2-combinations from the set $\{a, b, c, d\}$ in lexicographic order. (6 points)
2) Suppose you are enumerating all permutations from the set $\{1,2,3,4,5\}$ and you are currently at " 12534 ". Find the next 4 permutations in lexicographic order. (4 points)
3) You roll 7 dice. What is the probability of getting two 3 's and five 4's? (6 points)
4) What is the coefficient of $x^{8}$ in $(3+2 x)^{17}$ ? (4 points)
5) Draw an example of a bipartite graph with 6 vertices such that every vertex has degree 2 . (4 points)
6) On the graph below, use Dijsktra's algorithm to find the shortest path from $v$ to $w$. Please use different colors to signify different meanings, and make a legend below to explain the colors. (12 points)

7) Below is a graph (actually 6 drawings of it). You can run Dijkstra's algorithm on this graph in at most 6 steps - do so, using each new graph to illustrate one new step. (6 points)

8) In the graph below, identify a cycle of length 4 through vertex $v$ that does not include vertex $d$. (4 points)

9) Sketch a graph with the adjacency matrix given below. (4 points)
$\left[\begin{array}{lllll}0 & 1 & 1 & 0 & 0 \\ 1 & 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 1 \\ 0 & 0 & 0 & 1 & 0\end{array}\right]$
