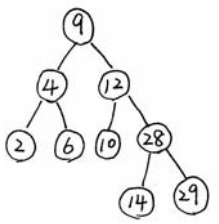
1. (10%) Let $f_1(N) = O(g_1((N))$ and $f_2(N) = O(g_2(N))$. Find $f_1(N)+f_2(N)$ and $f_1(N)\times f_2(N)$ in terms of the "big O" notation.
2. (10%) Draw the breadth-first and depth-first spanning trees of the complete graph with 5 vertices.
3. (10%) Consider the minimum-cost spanning tree problem. The edge set of a graph is denoted as {$e1$ = (A, B, 10), $e2$ = (A, C, 5), $e3$ = (C, D, 4), $e4$ = (C, E, 3), $e5$ = (D, E, 6), $e6$ = (A, D, 9)}, where (x, y, w) represents an edge between x and y with weight w. Using Kruskal's algorithm, suppose that edges $e2$, $e3$, and $e4$ have been selected during the construction of the spanning tree. Answer the following two questions.
   (a) How many more edges are needed in order to form a spanning tree?
   (b) What is the next edge that will be selected into the spanning tree?
4. (10%) Describe 2 methods for handling overflows in a hash table.
5. (10%) Show the result of inserting 26 into the following AVL tree



6. (10%) Convert the expression ((a+b)-c*(d+e)+f)/(g+h*i) to prefix and postfix expressions.
7. (10%) Write the algorithm for
   (a) Concatenate two circular lists
   (b) To delete the first node from the circular list
8. (10%) Given the binary tree whose inorder and preorder sequences are "maxengbyc" and "gamexncby", respectively. Please reconstruct the binary tree.
9. (10%) Please sketch a graph to explain what is the "Traveling Salesman Problem"?
10. (10%) By the row major, define one 3-dimensional matrix A[8][6][5], and &(A[0][0][0]) = α.
    (a) What is &(A[2][3][4])?
    (b) (b) If &(A[i][j][k]) = α + 100, what are i, j, and k?