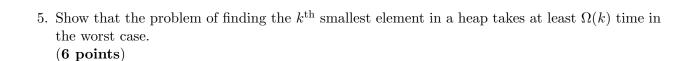
Fall 2018, CMPSC 465: practice for Exam 3 (was a Closed book and closed notes, no 'cheat sheet', no Please don't use cell phones during the exam. Answer questions in the space provided. The exam is for 40 points.	
Name:	Section:
<ol> <li>Draw the 7-item hash table resulting from hashin function h(i) = (2i + 1) mod 7 and assuming collinear probing.</li> <li>(6 points)</li> </ol>	
<ol> <li>Draw a binary tree with height 4 and maximum (6 points)</li> </ol>	number of external nodes. Is this tree unique?

3.	Complete the pseudocode for the remove( $p$ ) operation in a doubly-linked list, where a node $p$ is deleted and previous and next pointers are updated. What is the worst-case asymptotic running time?  (5 points)
	Algorithm remove $(p)$ :

4. Describe how to implement a stack using two queues. What is the running time of the push() and pop() methods in this case?

(6 points)



6. Suppose we perform a DeleteMin operation on the min heap H = [1, 2, 3, 5, 6, 8, 11, 15] (the heap is stored here implicitly in the form of an array). Show the steps performed after deletion to restore the heap order of elements.

(5 points)

7.	Insert items with the following keys (in the given order) into an initially empty binary search
	tree: 30, 40, 50, 24. Draw the tree that results after each insertion.
	(6 points)