CSC 18C Final Exam – Spring 2016 Name: Mauricio S. Perez

Chapters 1-3: Bags/Collections

1. **True / False**: All entries of a bag must have the same data type or a subtype of that data type.

2. Explain how to implement the *clear* method in a chain.

```
public void clear(){
        while (!isEmpty())
        remove();
} // end clear
        //You can call it in your bag method using a bag object to then clear the
        //reference of your desired object
```

3. What happens when you access a reference that is null?

   It depends if its a double linked list or a linked list. There can be a null at the beginning or the end of the list to indicate the start or the end. If an element is null, then it can return null.

Chapters 5-6: Stacks

4. **True / False**: Infix expressions are easier to evaluate than postfix expressions.

5. Convert the following infix expression to a postfix expression:
   (a + b) * (c – d) / ((e – f) * (g + h))

   (ab+) * (cd-) / ((ef-)* (gh+))

   (ab+) (cd-) * / ((ef-)(gh+) *)

   ((ab+) (cd-) *) (((ef-)(gh+) *)) /

Chapters 7-9: Sorting/Recursion

6. **True / False**: Activation records for recursive methods are the same as activation records for non-recursive methods.

7. Java sorting implementations sort objects that implement the _____ interface.
    a. Comparable
    b. Sortable
    c. Hierarchical
    d. All of the above

Chapters 10-11: Queues

8. **True / False**: The item most recently added to a queue is at the back of the queue.

9. Which of the following real-world events could be simulated using a queue?
    a. bank line
    b. a shared network printer
    c. restaurant reservation list
    d. all of the above

10. What type of behavior defines a queue?
    a. first-in first-out - FIFO
    b. first-in last-out
    c. last-in first-out
    d. none of the above

11. How does a queue organize it items?
    a. according to the order in which they were added
    b. by priority
    c. alphabetically
    d. randomly

e. none of the above

12. Where does a queue add new items?

    a. at the back

    b. at the front

    c. in the middle

    d. randomly

    e. none of the above

Chapters 12-16: Lists

13. **True / False**: Retrieving a list entry using a linked implementation is faster than using an array representation.

14. Outline the basic steps to add a node to the end of a linked implementation of a list.

    Find the end of the linked list.

    Create the next element.

    Have the end point to the created element.

    Assign the created elements previous as the last element.

Chapters 23-27: Trees

15. **True / False**: In a tree, nodes are arranged in levels that indicate the nodes' hierarchy.

16. List the steps of a preorder traversal of a binary tree.

    vlr – Value, Left, Right

    1. Visit the root before we visit the root's subtrees.

    2. Print value.

    3. Visit all the nodes in the root's left subtree.

    4. Visit the nodes in the right subtree.

17. List the steps of a postorder traversal of a binary tree.

    lvr – left, value, right

    1. Visit all the nodes in the root's left subtree
    2. When left most value is reached, print value
    3. Visit all the nodes in the root's right subtree
    4. Visit the root

18. List the steps of an inorder traversal of a binary tree.

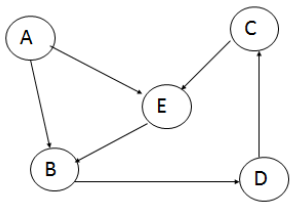
    lvr – Left, Value, right

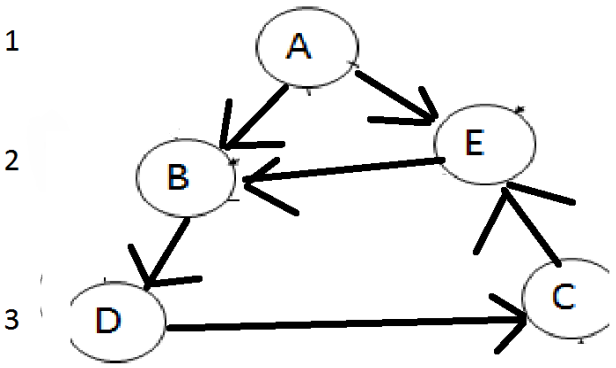
    1. Visit all the nodes in the root's left subtree
    2. When most left, print value
    3. Visit the root
    4. Visit all the nodes in the root's right subtree

Chapters 28-29: Graphs

19. Adjacent vertices are called
    a. neighbors
    b. siblings
    c. both a & b
    d. none of the above

20. Give the depth-first traversal of the following graph beginning at vertex A.





a → b → d → c