

Quiz 2 (30 points) – This is a closed book, open notes quiz. **Solutions**

1. Consider the following code:

```
Stack<Integer> stack = new LinkedStack<Integer>();
int n = 12;
while (n > 0){
    stack.push(n%2);
    n = n/2;
}

String result = "";
while (!stack.isEmpty()){
    result += stack.pop();
}

System.out.println(result);
}
```

- (a) (7 points) What is printed by the code?

Solution:

1100

- (b) (3 points) Describe *in 8 words or less* what this program does.

Solution: Prints the number in binary.

2. (10 points) What is printed by the following code?

```
Queue<Integer> queue = new ArrayQueue<>();

for(int i = 0; i < 10; i++){
    queue.enqueue(i);
}

queue.dequeue();
queue.front();
queue.dequeue();
queue.dequeue();

int x = queue.front();
System.out.println(x);
```

Solution:

3

3. (10 points) Suppose we added a new operation to our List ADT. This new operation is called `setSecontToLast` and sets the second-to-last element in the list to a new value.

(a) What is the running-time of this new operation when used with a array-based list?

Solution:

$\Theta(1)$

(b) What is the running-time of this new operation when used with a singly-linked list?

Solution:

$\Theta(n)$

(c) What is the running-time of this new operation when used with a double-linked list?

Solution:

$\Theta(1)$