Name: _______________________________________

Directions: MAKE SURE TO COPY YOUR ANSWERS TO A SEPARATE SHEET FOR SENDING ME AN ELECTRONIC COPY LATER.

1. This problem concerns the program psax.py, which monitors processes, in the curses chapter of our book.

(a) (5) State the number of a line in which an instance variable is accessed. If there is no such line, write NONE.

(b) (10) State the number of a line in which a class variable is accessed. If there is no such line, write NONE.

(c) (10) State the number of a line in which a class method is accessed. If there is no such line, write NONE.

(d) (10) Suppose the file gy consists of a single line with contents ‘uuddkkrr

2. (30) Consider the binary tree example, Section 1.20. We will add a new method max() to the class treenode. Note since it is a method rather than a freestanding function, it will not conflict with the built-in Python function max(), which works as follows:

```python
>>> max(12,5,13)
13
```

If z is an object of the class treenode, then

```python
z.max()
```

will return the maximum value in the tree rooted at z.

Example:

```python
>>> x = [12,5,13,10,8,6,28]
>>> tr = bintree.tree()
>>> for n in x: tr.insert(n)
>>> tr.root.max()
28
```

Fill in the blanks:

```python
def max(self):
    s = blank(a)
    if blank(b) : s = blank(c)
    return s
```

3. (25) Here we will deal with a class representing a vending machine. Each object of this class represents one machine, but all the machines carry the same items (though the current size of the stock of a given item may vary from machine to machine).

The inventory variable will be a dictionary with keys being item names and values being the current stocks of those items, e.g. ‘Kit Kat’:8 signifying that this machine currently holds a stock of 8 Kit Kat bars.

The method newstock() adds to the stocks of the given items; e.g. m.newstock({'Kit Kat':3,'Sun Chips':2}) would record that the stocks of Kit Kat bars and bags of Sun Chips at machine m have been replenished by 3 bars and 2 bags, respectively.

Fill in the blanks:

```python
class machine:
    itemnames = []
    def __init__(self):
        self.inventory = blank(a)
        for nn in blank(b) :
            self.inventory[nn] = 0
    def newstock(self,newitems):
        for itm in blank(c) :
            blank(d) += blank(e)
```

4. (10) This is a continuation of Problem 3. The following test of the above code produces an error:

```python
>>> m = machine()
>>> machine.itemnames = ['a','b']
>>> m.newstock({'b':3})
Traceback (most recent call last):
  File "<stdin>", line 14, in newstock
  File "<stdin>", line 1, in <module>
KeyError: 'b'
```

State in a SINGLE, BRIEF line how to fix this test.

Solutions:

1. Note that os and curses are modules, not classes, as can be seen by the fact that they are imported.

1a. NONE

1b. any line containing “gb.”

1c. NONE

1d. The psax.py program itself would be killed!

2a.

```python
self.value
```

2b.

```python
self.right != None
```

2c.

```python
self.right.max()
```

3a.

```python
{}
```

3b.

```python
machine.itemnames
```

3c.

```python
newitems.keys()
```

3d.

```python
self.inventory[itm]
```

3e.

```python
newitems[itm]
```

4. Swap the first two lines.