Write your name ONLY on this cover page.

Turn off cell phones, pagers, and anything that makes a noise.

Nothing is allowed on the desk top but the test, pens, pencils, erasers, and drinks.

Do not ask a question in a way that gives away the answer to the test question.

In any code that you write on this test, you do not have to write comments or print statements that explain what the program does. Just write enough code to do what is asked.

If the code requires import statements, you must write the import statement.

1. Write the specifications, as defined by the software development process, for the following program.

```python
def main():
    rad = eval(input("Enter radius: "))
    area = 3.14 * rad ** 2
    print("Area is:", area)
```

Program calculates area of a circle.

Input: radius

Output: Area of circle

2. Write a code segment that calculates the product of a set of values input by the user. Assume that the number of values that the user will input is stored in a variable, numValues.

```python
product = 1
for i in range(numValues):
    num = eval(input("#:"))
    product = product * num
print(product)
```
3. For the following binary/decimal conversions assume the leftmost bit is the sign bit.
   a. Represent the decimal number -55 in a byte.
      \[
      \begin{array}{cccccccc}
      4 & 3 & 2 & 1 & 0 \\
      1 & 0 & 1 & 1 & 0 & 1 & 1 & 1
      \end{array}
      \]
   b. Represent the binary number 01101100 as a base 10 integer.
      \[
      \begin{array}{c}
      64 \\
      + 32 \\
      + 8 \\
      \hline
      108
      \end{array}
      \]

4. An integer is stored in 32 bits. Using base 2 notation what is the range of integer values?
   \[
   - (2^{31} - 1) \quad + \quad 2^{31} - 1
   \]
5. In the blank to the right, write the value that Python would put into the variable `x`.

a. 
   \[ x = 5 - 4 - 3 \]
   \[ -2 \]

b. 
   \[ x = 2 ** 3 ** 2 \]
   \[ 512 \]

c. 
   \[ x = 7 * 2 ** 3 + 9 / 2 \]
   \[ 60.5 \]

d. 
   \[ x = 11 / \text{int}(2.5) // 2 \]
   \[ 2.0 \]

e. 
   \[ x = 8 - 5 / (9 - 4) \]
   \[ 7.0 \]

f. 
   \[ x = 4 // 3 + 9 \% 3 - 4 \]
   \[ -3 \]

g. 
   \[ x = \text{abs}(-7.5) \]
   \[ 7.5 \]

h. 
   \[ x = \text{int}(9.99) \]
   \[ 9 \]

i. 
   \[ x = \text{float}(-1) \]
   \[ -1.0 \]

j. 
   \[ x = \text{eval}("7") \]
   \[ 7 \]

6. What is the output of each of the following code segments? Indicate spaces as appropriate. Show your work for partial credit.

a. for i in range(3):
   print (i**2, end = " ")

   \[ 0 \quad 4 \]

b. for i in range(5,8):
   print (i // 2, end = " ")

   \[ 2 \quad 3 \quad 3 \]

c. for i in range(18, 6, -3):
   print (i)

   \[ 18 \]
   \[ 15 \]
   \[ 12 \]

   \[ 9 \]

d. total = 0
   for i in range(1, 11, 2):
      total = total + 1
   print (total)

   \[ 5 \]

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7. Write a program to ask the user for the values of $h$ and $g$. Then calculate the following and output the results.

```python
import math

h = eval(input("h: "))
g = eval(input("g: "))

print(math.pi * math.sqrt(g**3 - h))
```

8. Write a program that asks the user for $n$, then adds $n$ terms of the series:

$$1 + \frac{2}{4} + \frac{3}{9} + \frac{4}{16} + \ldots + \frac{n}{n^2}$$

and displays the result.

```python
n = eval(input("n: "))
sum = 0
for i in range(1, n+1):
    sum = sum + i / (i**2)
print(sum)
```
9. Assuming the assignment statement:

```python
text = "Sue, Bill, and Bob"
```

What is the value of `x` in each of the following?

- a. `x = text.find("",")`
  - `x = 3`
- b. `x = text.split("",")`
  - `x = ['Sue', 'Bill', 'and Bob']`
- c. `y = text.split(" ")`
  - `x = len(y[0])`
  - `x = 4`
- d. `x = chr(ord(text[0]))`
  - `x = 's'`
- e. `x = text[0:4]`
  - `x = 'Sue,'`
  - `x = 'Bee'`

10. Given the following code, what would be the output?

```python
def calculateValues(nums):
    values = []
    for num in nums:
        values.append(num * 2)
    return values

def main():
    nums = [7, 3, 5]
    print(nums)
    totals = calculateValues(nums)
    print(totals)
main() 
```

```
[7, 3, 5]
[7, 3, 5]
[7, 3, 5]
```
11. Write a program that accepts a string representing a person’s first, middle and last name and returns their corresponding Edisto email address all in lower case. For example, Jane Elizabeth Monferdini should return “jemonferdi@edisto.cofc.edu”. The email address is the first initial of the person’s first name, the first initial of the middle name, and the first 8 characters of the last name followed by the at sign and “edisto.cofc.edu”.

```python
name = input("Name:\n")
names = name.split(" ")
first = names[0]
middle = names[1]
last = names[2].lower()[:8]
fchar = first[0].lower()
mchar = middle[0].lower()
char = last[0].lower()
print(fchar + mchar + last + "@edisto.cofc.edu")
```

12. Show the string that would result from:

(a) “Looks like {1} and {0} for breakfast”.format(“eggs”, “spam”)

```
*Looks like spam and eggs for breakfast*
```

(b) “Hello {1}”.format(“Susan”, “Computewell”)

```
Hello Computewell
```

(c) “{1:0.2f} {0:0.2f}”.format(2.3, 2.3468)

```
2.35 2.30
```

(d) “{1:3}”.format(“14”)

```
Error
```