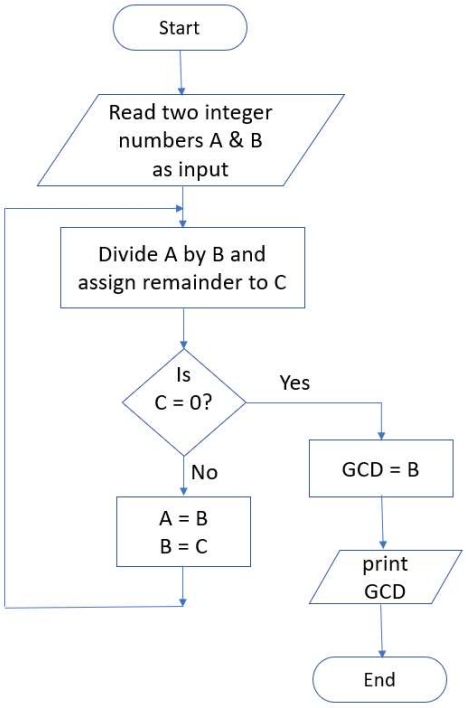
CSE101 – Midterm Exam 1

11-Apr-2019 **Total points: 50**

Name: _____ **Student ID # _____**

Instructions: Read the questions carefully before attempting to write the answer. Write the answers in the space provided below each question. Use of pencil is encouraged, so that you can erase and overwrite. Make sure that your handwriting is legible. Rough work sheet is provided at the end of answer sheet – which is to be used only for rough work, not for writing answers.

1. Given the following flowchart, write corresponding Python code (without using function) to calculate greatest common divisor (GCD) of two integers A & B using Euclidian method. The Python code should be accurate and should compile and run successfully. (6 pts)



Answer

2. Suppose the following strings are defined in an interactive session:

```
>>> proverb = "Others' rice cakes always look bigger."
>>> wordlist = proverb.split()
>>> word = "cakes"
```

What will Python print as the value of the following expressions? (6 pts)

a. `len(wordlist)` _____

b. `print(wordlist)` _____

c. `word in wordlist` _____

d. `proverb.lower().count('o')` _____

e. `wordlist[:3]` _____

f. `wordlist[-2:]` _____

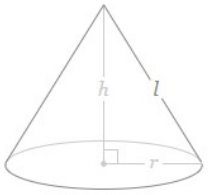
3. Write two Python functions corresponding to following formulas for calculating and returning surface area and volume of a right circular cone. Both of the functions accept as input h (height of cone) and r (radius of cone) as shown in the following figure. Make use of math.pi value in your code. Return result upto two decimal places using function round. (8 pts)

Formula for volume of a cone:

$$V = \pi r^2 \frac{h}{3}$$

Formula for surface area of a cone:

$$A = \pi r \left(r + \sqrt{h^2 + r^2} \right)$$



Answer:

```
import math
def coneVolume(h, r):




def coneSurfaceArea(h, r):




#testcases
>>>print(coneVolume(10,5))
261.8
>>>print(coneSurfaceArea(10,5))
254.16
```

4. Given a variable x that refers to a string as follows, use string slicing to write the following expressions:

```
x = ' Seutobwochie'
```

a. An expression that is equivalent to the string containing the last 6 characters of x. Your expression should evaluate to `'wochie'`. (2 pts)

Answer: _____

b. An expression that would extract the word `'Seutob'` from the above string x. (2 pts)

Answer: _____

c. An expression that would extract the word `'tobwoc'` from the above string x. (2 pts)

Answer: _____

5. Suppose the following list is defined in an interactive What is the output of each of the following code fragments? There are no syntax errors in the code. (6 pts)

```
>>> a = ["achim", "jeong-o", "jeonyeog", "bam"]
```

a. `print(len(a))` _____

b. `print(len(a[1]))` _____

c. `print(a[2][1:5])` _____

d. `print(a[3]*3)` _____

e. `print(a[0] + a[3])` _____

f. `print(a[1][-3:])` _____

6. What value will be stored in the variable result after the following code has been executed? (2 pts)

```
nums = [6, 5, 4, 8, 10, 12, 5, 7, 0, 9, 11]
result = []
for n in range (int(len(nums) / 2)):
      result.append(nums[n])
```

a. [6, 5, 4, 8, 10, 12]
b. [6, 5, 4, 8, 10]
c. [6, 5, 4, 8]
d. None of the above

7. What is the output of the following code fragment? (2 pts)

```
name = "Madagascar island"
result = ""
for ch in name:
    if ch.upper() not in 'AS':
          result += ch
print(result)
```

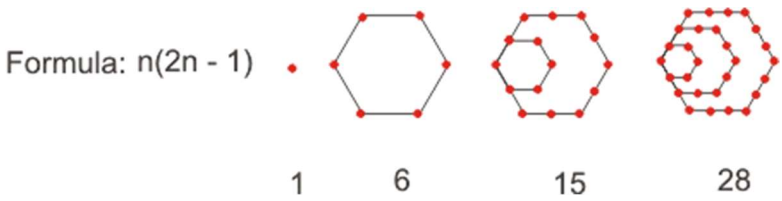
a. Madagascar island
b. Mdgscr islnd
c. Mdgcr ilnd
d. Madagacar iland

8. What is the output of the following code fragment? (2 pts)

```
d = 10
e = 12
f = 8
if e - f == f - 1:
      print('X')
elif d - f > e:
      print('Y')
else:
      print('Z')
```

a. X
b. Y
c. Z
d. None of the above

9. A **hexagonal numbers series** along with a formula for n^{th} term is given as follows:



Write a function with the following definition to return a list of n elements in a hexagonal number series where n is the number of terms in a series. (6 pts)

```
def hexagonalSeries(n):
```

```
#testcase
>>> print(hexagonalSeries(6))
[1, 6, 15, 28, 45, 66]
```

10. Create a flowchart for the interactive voice response program in a hospital that receives a user call and asks user for input between numbers 1 to 4 and transfers calls to appropriate department depending on the user input 1, 2, 3 or 4. The departments to be connected are: input 1 -> Cardiology (ext. 2203), input 2 -> Nephrology (ext. 2015), input 3 -> Radiology (2145), input 4 -> Receptionist (ext. 2217). If the user presses inputs other than 1 to 4, the program asks user for valid input and continues till the user has entered valid input. (6 pts)

Rough Work