Reg	No.
NCY	110.



IV SEMESTER B.TECH. (COMPUTER SCIENCE AND ENGINEERING) END SEMESTER EXAMINATIONS, April/May 2018 SUBJECT: PYTHON PROGRAMMING [CSE 3292] REVISED CREDIT SYSTEM

(26/06/2018)

TIME : 3 HOUR

Instructions to the Candidates

- Answer all the following Questions.
- Missing data can be assumed suitably.
- 1 A. Briefly explain the parts of a python program and also discuss at least four benefits of using Python?
- 1 B. Calculate rainfall in gallons for some number of inches on 1 acre. Write a python program to do the following. [*1 acre = 43,560 square feet; 1 cubic foot = 7.48051945 gallons*]
 - a) Prompt the user for the number of inches that have fallen.
 - b) Find the volume (in cubic feet) of water (where volume = depth * area).
 - c) Convert the volume (in cubic feet) to gallons.
- 1 C. Write a python program to solve a quadratic equations using if..else statement. The formula that calculates roots for a quadratic equation $ax^2+bx+c=0$ is the quadratic formula $x = -b \pm \sqrt{b^2 - 4ac}/2a$. Because the square root of a negative is imaginary, one can use the expression under the square root (known as the *discriminant*) to check for the type of root. If the discriminant is negative, the roots are imaginary. If the discriminant is zero, there is having equal

root. If the discriminant is positive, there are two roots.

- a) The program, that uses the quadratic formula to generate real roots, i.e., ignores the imaginary roots. Use the discriminant to determine whether there is one root or two roots and then print the appropriate answer.
- b) Python uses the letter "j" to represent the mathematical imaginary number "i" (a convention used in electrical engineering). However, the Python "j" must always be preceded by a number. That is, "1j" is equivalent to the mathematical "i." Add the ability to handle imaginary roots to your program.
- 2 A. i) What output occurs for the following program (error free) on the given input?

```
user_str = input("Enter a positive integer:") # Line 1
my_int = int(user_str)
count = 0
while my_int > 0:
    if my_int % 2 == 1:
        my_int = my_int//2
    else:
        my_int = my_int - 1
        count = count + 1 # Line 2
print(count) # Line 3
```

2M

4M

4M

MAX.MARKS: 50

print(my_int) # Line 4

- a) Given user input of 11, what value is output by Line 3 and 4 of the program?
- b) Given user input of 99, what value is output by Line 3 and 4 of the program?
- ii) Write a python program to generate the hailstone sequence.

The hailstone formula is as follows:

- -If the number is even, divide it by 2.
- -If the number is odd, multiply by 3 and add 1.
- -When the number reaches 1, quit.

For example, if you start with 5, you get the following sequence: 5, 16, 8, 4, 2, 1.

- 2 B. Write a python program to find the GCD of two integer numbers.
 - a) Define a function 'gcd', which can take two integers as parameters and returns the greatest common divisor of two integers.
 - b) Define a function 'main', which prompts the user to enter two integers and displays their greatest common divisor
 - c) Demonstrate the main function with inputsi) num1=13 and num2 = 33ii) num1= 32 and num2=12.
- 2 C. Compare and contrast list with tuple. Write a Python program which initializes two lists named "list1" and "list2" to positive integer numbers and displays 1 if they have at least one common member, otherwise displays 0. Make use of for loop in your program.
 3M
- 3 A. Write a function that finds the number of occurrences of a specified character in a string using the following header:

def count(s, ch):

The str class has the count method. Implement your method without using the count method. For example, count("Welcome", 'e') returns 2. Write a test program that prompts the user to enter a string followed by a character and displays the number of occurrences of the character in the string. 2M

3 B. Show the output of the following code:

def main():

```
d = {"red":4, "blue":1, "green":14, "yellow":2}
print(d["red"])
print(list(d.keys()))
print(list(d.values()))
print("blue" in d)
print("purple" in d)
d["blue"] += 10
print(d["blue"])
```

main() # Call the main function

- 3 C. a) How do you open a file for reading, for writing, and for appending, respectively?
 - b) When you open a file for reading, what happens if the file does not exist?
 - c) When you open a file for writing, what happens if the file already exists?
 - d) What method do you use to read 30 characters from a file?
 - e) Write a program that will count the number of characters, words, and lines in a file. Words are separated by a whitespace character. Your program should prompt the user to enter a filename.
 5M
- 4 A. Write a python module named "sample" to include two functions named "add" and "mul" which take two arguments *a* and *b* to return the sum and product of these numbers respectively. Demonstrate the importing by making use of "from import *" version to compute sum and product of 10 and 20 in a module named "modtest". Show clearly the modules and their contents.
- 4 B. i) Write a Python program to convert an integer list of size 3*3 into a numpy array and display the CSE 3292 Page 2 of 3

3M

4M

3M

size of the array in each dimension and the type of array element. Also write the output for your program.

ii) Consider the following matrices of order 3x3:

A = ((1, 2, 3), (4, 5, 6), (7, 8, 10)) and B = ((7, 8, 10), (4, 5, 6), (1, 2, 3))

- ii) Write a python program to perform the following using Numeric Python (numpy).
 - a) Add and Subtract of the Matrices 'A' and 'B', print the resultant matrix C for add and D for subtract.
 - b) Compute the product of matrix A and B (element-wise) and print the resultant matrix E.
 - c) Compute the sum of each column of Matrix A and sum of each row of Matrix B.
 - d) Sort the elements of resultant matrix E and print the resultant Matrix F.
 - e) Transpose the Matrix F and print the result.
- 4 C. Assume that we wish to maintain a database that contains the flight information of an airline during a particular year. This database maintains information about flights, pilots, and assignments of pilots to flights. Each flight has a unique flight number, a departure city, a destination city, a departure time, and an arrival time. Each pilot has a unique company ID, a name, and an experience. Pilots are assigned to fly certain flights on particular days of the year. The table schema as follows:

Flight (flight number, Dept. city, Dest. City, Dept. time, Arrival time)

Pilot(CompanyID, Name, Experience)

Assigned_to(CompanyID, Flight_number, Date)

Create a database 'airline.db' and write a Python program to perform the following tasks using SQLITE.

- a) Write a query to create the tables (Flight, Pilot, and Assigned to).
- b) Write a query to add the suitable data to tables (Flight, Pilot and Assigned_to).
- c) Write a query to retrieve the data from the tables (Flight, Pilot and Assigned_to).
- 5 A. Write a program that calculates the future value of an investment at a given interest rate for a specified number of years. The formula for the calculation is as follows:

futureValue = investmentAmount * (1 + monthlyInterestRate) years* 12 Use text fields for users to enter the investment amount, years, and interest rate. Display the future amount in a text field when the user clicks the Calculate button, as shown in below.

7% Investment Calculator		
In∨estment ∧mount	10000	
Vears	3	
Annual Interest Rate	3.25	
Future Value	11022.66	
	Calculate	

5 B. What is CGI? Briefly discuss the n-tier architecture with neat diagram.

What is a web framework? Mention the reasons why you should choose Python framework over 5 C. your own? 3M

4M

4M

3M

4M