04/01/24 (E)

[This question paper contains 8 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 952 **G**

Unique Paper Code : 2362202302

Name of the Paper : Python Programming (DSC), for NEP_UGCF 2022

Name of the Course : **Bahelor of Arts Programme with Operational Research as Major**

Semester : III

Duration : 3 Hours Maximum Marks : 90

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **five** questions.
3. **All** questions carry equal marks.

1. (a) Differentiate between interactive mode and script mode in Python. Provide examples of when you would use each mode, and explain their advantages and limitations. (6)

(b) Elaborate on the difference between expression and statement. Further evaluate the expression 15 & 22, involving bitwise operator. (6)

(c) How are semantic errors different from syntax errors. Rewrite the following Python program after removing all the syntactical errors (if any)

```
def a_valchk:
    a = input("Enter the value of a")
    if a% 2 = 0:
        print a,"is even"
    else if a<0:
        print a,"should be positive"
    else;
        print a,"is odd"
```

(6)

2. (a) Write a program in python to plot a graph for the function $y = x^3$. (6)

(b) Explain the need for continue, break and pass statements. Illustrate by examples. (6)

(c) What will be output of the following codes –

(i)
```
import numpy as np
b = np. array ([9,11,19,1,17,5,2,4])
print(b)
bool_arr = b > 9
print(bool_arr)
new_arr = b[bool_arr]
print(new_arr)
```

(ii)
```
def fun(a = 0, b = 1):
    return a * b
print(fun(5, 6))
print(fun(6))
print(fun(b = 5))
print(fun())
```
(6)

3. (a) Discuss on the concept of identifiers and keywords in python programming. Provide examples of valid identifiers and keywords in Python. Discuss the rules and conventions for naming identifiers. (6)

(b) Explain conditional statements and loop control statements in python programming. Provide examples of each and discuss how they are used to control the flow of a program. (6)

(c) What are negative indexes and why are they used? Consider the following string- teststring= "Python Programming"

Give the execution results of the following string operations –

(i) print(teststring.capitalize())

(ii) print(teststring[::3])

(iii) print(teststring[len(teststring)-1])

(iv) print(teststring[::-2])

(v) print(teststring[:3] + teststring[-8::-2])

(vi) teststring.replace('Programming', 'Examination') followed by print(teststring) (6)

4. (a) Explain the concept of dictionaries in Python and their key-value pair structure. Write a program to create a dictionary and remove one key. (6)

(b) Explain the concept of function arguments and parameters. Write a function that accepts as an input parameter the number of rows to be printed and prints a figure like :

```
        5
      4 5
    3 4 5
  2 3 4 5
1 2 3 4 5
```

(6)

(c) Explain the significance of indentation in Python programming.

Consider the following code

```
import matplotlib.pyplot as plt
weekdays = ['Tuesday','Thursday','Friday']
sales = [1000,2000,3000]
plt.bar(weekdays,sales)
```

Will the code display any chart? If no, rectify the code to execute and display the output. (6)

5. (a) What are the different types of Data Structures in Pandas? Provide a step-by-step example of how to read a CSV file into a Pandas DataFrame. (6)

(b) Write a menu driven program to perform following list operations after taking a list from the user as input –

(i) Modify an existing element

(ii) Insert and element

(iii) Delete an existing element with a given value

(iv) Reverse the order of elements in the list

(v) Append a list to the given list

(vi) Sort the list in ascending order (6)

(c) Differentiate between any **two** of the following :

(i) Built in functions and User-defined functions

(ii) Mutable and Immutable Data Types

(iii) Relational Operators and Logical Operators (6)

6. (a) What are ways of creating 1D, 2D and 3D arrays in NumPy? Elaborate. (6)

(b) Write a program in python to plot correlation between two variables. (6)

(c) Explain the primary characteristics and uses of tuples in Python. Write the output of the following code –

```
T1=(5,7,8)

T2=((5,7,8))

print(T1 in T2)

print(5 in T2)

print(5 in T1)

print(T1+T2)
```

(6)