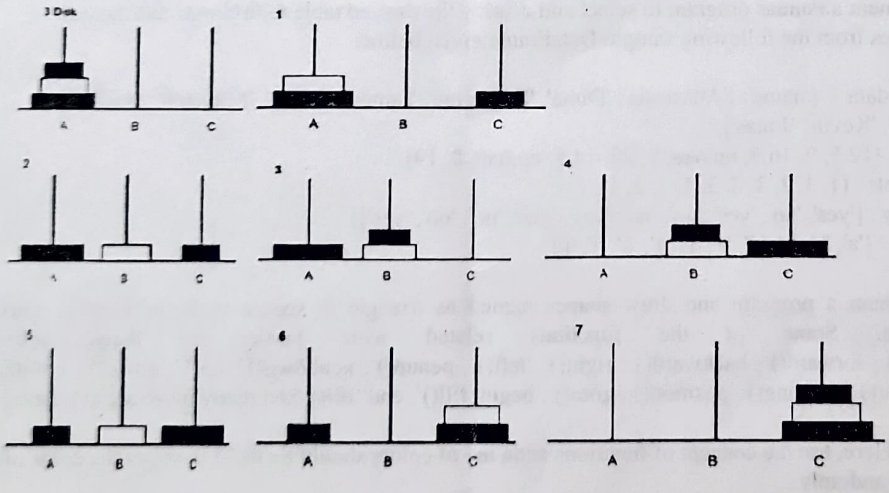
NATIONAL INSTITUTE OF TECHNOLOGY, KURUKSHETRA
THEORY EXAMINATION(Regular+ Re-appear)
Question Paper

Month and year: **May-June 2022**
Program: **B.Tech.-CO/IT**
Subject: **Programming Using Python**
Maximum Marks: **50**
Number of Questions to be attempted: **5**

Total no. of pages used: **3**
Exam Date: **25.05.2022**
Course code: **CSPE-22/ITPE-22**
Time allowed: **03Hours**
Total No of Questions: **5**

Note: 1. First four questions are compulsory and a choice is given in Q:5
2. All programs must be modular, readable, efficient and should work for normal as well as exceptional Inputs. Modularity and readability must not be compromised in any program.

Q-1.	**a.**Implement a function in Python named unique_common that accepts two lists both of which contain integers as parameters and returns a sorted list (ascending order) which contains unique common elements from both the lists. If there are no common elements between the two lists, then your function should return the keyword- None. For example, if two of the lists received by the function are: ([5, 6, -7, 8, 8, 9, 9, 10], [2, 4, 8, 8, 5, -7]) You can see that elements 5, -7, and 8 are common in both the first list and the second list and that the common element 8 occurs twice in both lists. Now you should return a sorted list (ascending order) of unique common elements like this: [-7,5,8] If the two lists received by the function are: ([5, 6, 7, 0], [3, 2, 3, 2]) Since, there are no common elements between the two lists; your function should return the keyword None. **b.**Discuss list and tuple in detail along with their uses and differences with the help of an example. Also, design a program that reads an unspecified numberof integers and finds the ones that have the most occurrences. For instance, if you enter 12 33 40 3 5 4 –3 3 3 2 0, the number 3 occurs most often (enter all numbers in one line). Further, If not one but several numbers have the most occurrences, all of them should be reported. For example, since 9 and 3 appear twice in the list 9 303 9 3 2 4, both occurrences should be reported.	5*2
Q:2	**a.**Implement a python program for Tower of Hanoi problem:  Tower of Hanoi is a mathematical puzzle where we have three rods and n disks. The objective of the puzzle is to move the entire stack to another rod, obeying the following simple rules: i) Only one disk can be moved at a time. ii) Each move consists of taking the upper disk from one of the stacks and placing it on top of another stack i.e. a disk can only be moved if it is the uppermost disk on a stack. iii) No disk may be placed on the top of a smaller disk.	5

b. Identify the error will occur when you run the following code? 2

```
def main():
print(min(min(5, 6), (51, 6)))

def min(n1, n2):
smallest = n1
if n2 < smallest:
smallest = n2

main() # Call the main function
```

c. Develop a pseudo code for multiplication table of user request with iterative count defined as 10 and with the condition, instead of printing the product of each iteration, print "#" if the product value is even and print "$" if the product value is odd, for each iteration product value. 3

Reference Example: **5 * 1 = $**
5 * 2 = #
5 * 3 = $

Q:3 Design a module that contains the following two functions for the Conversions between feet and meters and function headers are given below. 10

```
# Converts from feet to meters     # Converts from meters to feet
deffootToMeter(foot):              defmeterToFoot(meter):
```

Now, write a program that invokes these functions to display the following tables in the same format and conversion formulas are given in the text box.

Feet	Meters	Meters	Feet
1.00	0.305	20.00	66.574
2.00	0.610	26.00	81.967
...			
9.02.745		60.0196.721	
10.03.050		66.0215.115	

The formulas forthe conversion are:
foot = meter / 0.305
meter = 0.305 * foot

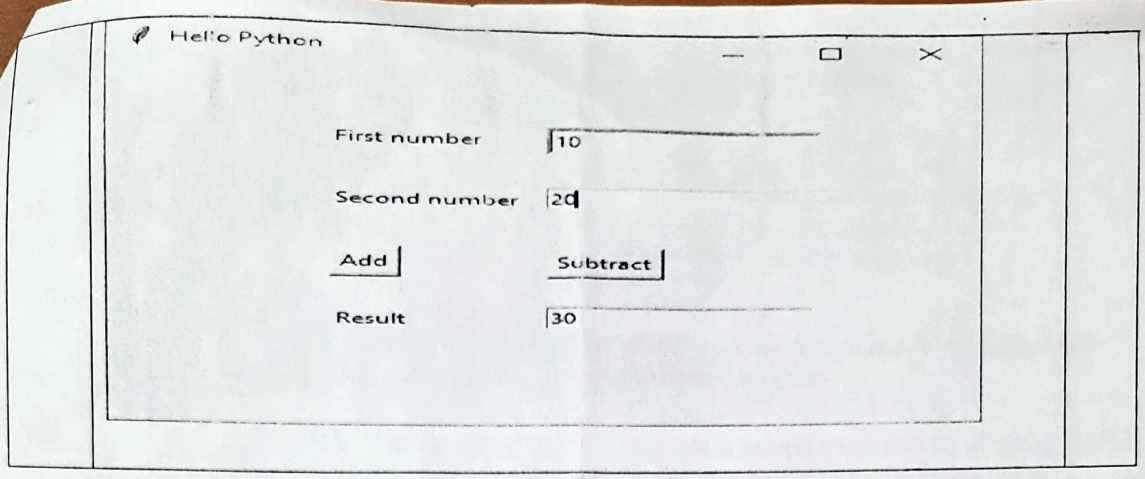
Q:4 Explain the significance of numpy and pandas along with their paramount functions. Also, implement a Pandas program to select and display the desired table with 'name' and 'score' columns from the following sample DataFrame given below: 10

```
exam_data = {'name': ['Anastasia', 'Dima', 'Katherine', 'James', 'Emily', 'Michael', 'Matthew',
'Laura', 'Kevin', 'Jonas'],
'score': [12.5, 9, 16.5, np.nan, 9, 20, 14.5, np.nan, 8, 19],
'attempts': [1, 3, 2, 3, 2, 3, 1, 1, 2, 1],
'qualify': ['yes', 'no', 'yes', 'no', 'no', 'yes', 'yes', 'no', 'no', 'yes']}
labels = ['a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j']
```

Q:5 Implement a program and draw shapes named as triangle & square with the help of Turtle module. Some of the functions related with Turtle are listed below: turtle() , forward() , backward() , right() , left() , penup() , pendown() , up() , down() , color() , fillcolor() , heading() , position() , goto() , begin_fill() , end_fill(), and many more are available. 10

Note: Here, use the concept of functions anda list of colors should be there to select the color of shape randomly.
(OR)

Implement a program with the help of Tkinter and create a simple GUI with the help of buttons, labels, entry fields, widget attributes such as sizes, fonts, colors layouts, etc. The structure of application is given below:


Hello Python
First number
10
Second number
20
Add
Subtract
Result
30

**********THE END**********