VIT
Vellore Institute of Technology

Final Assessment Test – June 2022
Course: ITA6017 - Python Programming
Time: Three Hours
Max. Marks: 100

KEEPING MOBILE PHONE/SMART WATCH, EVEN IN 'OFF' POSITION IS TREATED AS EXAM MALPRACTICE

Answer **ALL** Questions
(10 X 10 = 100 Marks)

1. Enumerate and explain the features of python.

2. a) Given a number, write the Python code to determine if it is a perfect square or not. **[5]**
A number 'n' is said to be a perfect square if sum of all of its proper divisors (all divisors other than itself) is equal to itself that is 'n'. For example, 6 is a perfect number since 6 = 1+2+3. Check boundary conditions and print 'Invalid input' for wrong input.

   b) The National Earthquake Information center characterizes the effect of earthquakes **[5]** based on Ritcher scale numbers. Write the python code to print the characterization given the Ritcher scale number.

Ritcher Scale Number	Characterization
n<5.0	Little or no damage
5.0 <= n<5.5	Some damage
n>5.5	Serious damage

   Check boundary conditions and print 'Invalid input' for wrong input.

3. a) The Utopian tree goes through *two* cycles of growth every year. The first growth **[5]** cycle occurs during the spring, when it *triples* in height. The second growth cycle occurs during the summer, when its height increases by half a meter. Now, a new Utopian tree sapling is planted at the beginning of spring. Its height is *1* meter. Write the python code to find the height of the tree after *N* growth cycles. For example, if the number of cycles is 2 then the height of the tree will be 3.5 meters. Print it as 3 meters and 500 centimetres. Check boundary conditions and print 'Invalid input' for wrong input.

   b) The DNA sequence is made up of four chemical bases, Adenine (A), **[5]** Cytosine (C), Thymine (T), and Guanine (G). For a given DNA sequence like "ATCTCAGTCGTTGTCTACATGA", write a python program to count the number of Adenine, Cytosine, Thymine and Guanine. Check for boundary conditions and print 'Invalid input' otherwise.

4. Given a position of coins of player1 and player2 in a 3X3 Tic Tac Toc board, write a python program to determine if the board position is a solution and if so, identify the winner of the game. In a Tic Tac Toc problem, if the coins in a row or column or along a diagonal is of the same player then he has won the game. Assume that player1 uses '1' as his coin and player2 uses '2' as his coin. '0' in the board represent empty cell.

5. In an electronic shop, laptops of brands 'Dell', 'HP', 'Lenovo', 'Sony', 'Acer' are available. Unit price of the brands of pendrive are 40000, 42000, 40180, 39400 and 39300 respectively and the avialable stock in hand is 10 for Dell,100 for HP, 50 for Lenovo, 4 for Sony, and 2 for Acer. A customer can enter the name of the brand of laptop he wants to purchase and the required quantity. Write the Python code to keep track of total bill amount. The program should keep asking for new items until 'stop' is entered for brand name. The program should display the total amount. The brand name entered by the customer should be made case in sensitive and if the user enters quantity greater than stock in hand then print "STOCK INSUFFICIENT". If the brand entered by the user is not in the shop then print "NOT AVAILABLE". But in both the cases compute cost for other items entered and continue getting new items. Print the items ordered by the customer in upper case and unit price of the item as a dictionary in sorted order and then the total cost to be paid by the customer.

6. The details of all employees (ID no, name, mobile number) of a company XYZ is stored and maintained by the company's IT department. On his birthday, the GM of the company wants to surprise a few of his employees with experience more than five years and whose ID number is divisible by 5 by giving Rs.5000. He instructs the ID department to display the mobile number along with the name of all employees who are eligible for gift. Write a program to automate the selection and intimation. Name of a person is in the form initial (One letter), dot and any number of alphabets, spaces. Check the validity of the name entered and validity of the mobile number. A valid mobile number must consist of 10 digits and the first digit must not be zero. Print 'Invalid input' when conditions are not satisfied and break the process of getting input. For each employee, get his id, name, experience and mobile number and display the details of all the employees who are eligible for a gift. ·

7. a) Given a phone number as a string in the following format, [Country code]-[Local [5] Area Code]-[Number] Ex: 91-462-234356

   Write a Python program to determine the country of the phone number using the following table.

Country Code	Country name
91	India
62	Indonesia
93	Afghanistan
213	Algeria

   b) Given a string, write a Python program to check whether the given string is a [5] palindrome. Palindrome is a sequence of characters which reads the same backward (from right to left) or forward (from left to right). The comparison must be made case insensitive that is, the input may be 'Madam' and the program should print Palindrome.

8. a) Define a function PrintPattern which takes three parameters, namely, a special [5] character, number of rows and number of columns. The function prints the special character for the specified number of rows and columns. Using the above function, explain the concept of positional arguments, keyword arguments and default arguments (default values are, '*', 4, 5).

   b) Consider the data of six students like name, age and mobile number are represented [5] as list of tuples. Create a DataFrame using this information.

9. Consider any data with four attributes in csv format by your own and illustrate the various data visualization formats using python.

10. Describe the various phases of the Embedded Product Development Life Cycle (EDLC).

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