Name: **Enrolment No:**	UPES UNIVERSITY OF TOMORROW

UPES

End Semester Examination, December 2023

Course: Programming in petroleum Engineering — **Semester: I**

Program: M. Tech (Petroleum Engineering) — **Time : 03 hrs**

Course Code: PEGI7023 — **Max. Marks: 100**

Instructions: (a) This is a closed book exam. Possessing a mobile phone and any other communication devices during the exam is strictly prohibited.

SECTION A (5Q x 4M = 20 Marks)

S. No.	Statement (s) of the question (s)	Marks	CO
Q 1	Write a python code to (a) define a list with named **lst** containing the following four elements below: **90 3.14 crude oil sour water** (b) define or create an object named **sec** that belongs to the class **time**	**2 + 2**	**CO1**
Q 2	Write a python code to (a) define a dictionary named **water** that can store the following properties of water with density (1000), viscosity (0.01) and specific heat (4.186). (b) Modify the viscosity to 0.05	**2 + 2**	**CO1**
Q 3	(a) Write a python code to create a complex number with 2 and 5 as the real part and imaginary part, respectively (b) Create a set data type that contains the three elements 4 9.8 random	**4**	**CO2 [2 M]** **CO3 [2 M]**
Q 4	Write a python program to (a) define a user define function named **sqr** that returns the square of an input number. (b) print the following words in its exact form as output containing all alphabets and special characters. **"python's \n code"**	**2 + 2**	**CO1**
Q 5	Write a python code to create (a) identity matrix (100 rows, 100 columns), and (b) a matrix (1 row, 100 columns) that contains only zero.	**2 + 2**	**CO1[2]** **CO2[1]** **CO3[1]**
SECTION B (4Q x 10M = 40 Marks)			
Q 6	(a) Show all the necessary steps and determine the binary representation of the number **41** (b) print(~9) For the python code above, the output was found to be **-10**. Use all detailed necessary steps to explain the reason.	**4 + 6**	**CO2**

Q 7	(a) Write a python program to create a matrix (named **mat1**) containing 1 ***2*** 3 (elements of 1st row), 4 ***5*** 6 (elements of 2nd row) and 7 ***8*** 9 (elements of 3rd row). (b) Use slicing, to create a variable named **mat2** that contains the elements of mat1 that are bold and italics.	**10**	**CO2 [5 M]** **CO3 [5 M]**
Q 8	Write a python program to create three numbers of classes, named as **A**, **B**, and **C**. **B** contains a method to find the sum of number series (such as 1, 2, 3, 4, 5, 6, and many more). While, **A** contains method to find the factorial of numbers. The class **C** do not have any methods defined. $$\frac{1+2+3+4+5+6+7+8+9+10}{10!}$$ Write a python program to evaluate the above expression only using the object that belongs to class **C**. Use appropriate names of your choice.	**10**	**CO2 [5 M]** **CO3 [5 M]**
Q 9	Write a python code to print the following pattern of **cone** exactly as shown in **Fig. 1**. **OR** Define a function named sorting that takes a list as input parameter and returns two lists as an output parameter. One list containing only even numbers and other list only contains odd numbers.	**10**	**CO 3 [6]** **CO 4 [4]**
SECTION C (2Q x 20M = 40 Marks)			
Q 10	Analyze the python codes below to predict the outputs: (2 marks each) (i) print(5 // 3) Output: _____ (ii) print(5 % 3) Output: _____ (iii) str1 = "python's code" print(str1[6]) Output: _____ (iv) print(str1[1:4]) Output: _____ (v) water = [] water.append("boil") print(water) Output: _____ (vi) word = "ab" for i in word: print("welcome {}".format(i)) Output: _____ (vii) print(len("python")) Output: _____ (vii) a, b, c, d = 1, 2, 3, 4 print(d > c**b) Output: _____ (viii) print(c > b or a > d) Output: _____ (ix) print(5 in [7.675, "float", 5]) Output: _____ (x) print(type({1, 2, "hello"})) Output: _____	**20**	**CO 2[5]** **CO 3 [10]** **CO 4 [5]**

Q 11	(a) Write a python program to define a function named **freq** that returns a dictionary which contains the frequency of each words in any sentence. The dictionary will contain the words as keys and the frequency as its corresponding values. Also include a step or line (s) of code (s) to check your program. **(b)** Write a python program to create a function named **series** that accumulates and returns a list containing of the series of numbers as shown in (i). The program should also work for (ii). How can you check whether the code written by you is correct or not. (i) 4.5, 5.0, 5.5, 6.0, …….., 9.0, 9.5, ……..., 99.0, 99.5, 100 (ii) 13, 13.5, 14, 14.5, ……, 50.0, 50.5, ……., 60.0, 60.5, 70 **OR** Imagine that an excel file named **data.csv** is stored in IDLE working directory or folder. The data in rows and columns are shown in **Table 1.** Write a python program to find the concentration of acetic acid for all samples. $(c = \frac{volume\ of\ acetic\ acid}{volume\ of\ acetic\ acid + volume\ of\ water})$	**10 + 10** **20**	**CO 2[5]** **CO 3 [10]** **CO 4 [5]**

Table 1: Sample of acetic acid and water mixed at different volume ratios.

Sample	acetic acid (ml)	water (ml)
A	1	5
B	2	4
C	3	3
D	4	2
E	5	1

Fig. 1: Triangular pattern