	Reg. No.:	
	Name :	

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TERM END EXAMINATIONS (TEE) – December 2021- January 2022

Programme	:	**B. Tech. [BAC, BAI, BAS, BCE, BCG, BCY, BME, MEI, MIP, MSI]**	**Semester**	:	**Fall 2021-22**
Course Name	:	**Introduction to Problem Solving and Programming**	**Course Code**	:	**CSE1021**
Faculty Name	:	**Ab Rouf Khan**	**Slot / Class No**	:	**F11+F12+F13 / 0091**
Time	:	**1 ½ hour**	**Max. Marks**	:	**50**

Answer ALL the Questions

Q. No.		Question Description	Marks
		PART - A (30 Marks)	
1	(a)	Take any real-world problem of your choice and apply *Polya's 4 Steps of Problem Solving* method to find the solution to the problem. Each step of the solution should be concise and clear.	10
		OR	
	(b)	What is the usage of the following statements in Python? Support your answer with valid examples in each case. i. ***break*** statement ii. ***continue*** statement iii. ***pass*** statement	10

2	(a)	Consider following recursive factorial function to compute the factorial of any given number.
		`def factorial(n):`
		`if (n==0):`
		`return 1`
		`else`
		`return n*factorial(n-1)`
		Execute the above given function to find ***factorial*** (**5**). Show all the possible steps to ***compute*** the value and to ***print*** the same in backtracking.
			10

		OR	
	(b)	What are the three different ways to find the square root of a number in Python? Write proper Python methods/codes supported by adequate Python ***import*** methods in each case.	10

3	(a)	What will be output after executing the following segments of code?
		i.
		``
		import array as arr
		new_arr=arr.array('i', [1,3,89,7,88, 76])
		print(res_arr=new_arr[::-1])
		``
		ii.
		``
		import numpy as test
		in_arr = test.array([2, 0, 1, 5, 4, 9, 6, 3, 7])
		print(out_arr = test.partition(in_arr, 4))
		``
		ii.
		``
		import array as myarr
		a=myarr.array('b',[3,6,4,8,10,12,14,16,18,20])
		a[8]=77
		print(a)
		``
		iv.
		``
		arr = [25, 11, 7, 75, 56, 77, 76, 8]
		min = arr[0]
		for i in range(0, len(arr)):
		  if(arr[i] > min):
		  min = arr[i]
		print(min)
		``
			10

		OR	
	(b)	Discuss the problem of removing *duplicates* from a sorted array in Python. Mention the need of taking an auxiliary array in the algorithmic solution of removal of duplicates. Create a function in Python to implement the algorithm required to perform the above task.	10
		PART - B (20 Marks)	
4		Use the prime factorization and Euclidian algorithm methods to find $\boldsymbol{GCD(603, 72)}$, and write the *recursive* and *iterative* Python codes corresponding to Euclidian algorithm method.	10
5		With the help of example in each case, mention the main characteristics of the following Python standard ***random*** module library functions. i. ***random.randrange()*** ii. ***random.randint()*** iii. ***random.uniform()*** iv. ***random.choice()*** v. ***random.choices()***	10
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