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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
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PART - A (30 Marks)

1	(a)	Take any real-world problem of your choice and apply <i>Polya's 4 Steps of Problem Solving</i> method to find the solution to the problem. Each step of the solution should be concise and clear.	10
	OR		
2	(b)	What is the usage of the following statements in Python? Support your answer with valid examples in each case. <ul style="list-style-type: none"> i. break statement ii. continue statement iii. pass statement 	10
	OR		
2	(a)	Consider following recursive factorial function to compute the factorial of any given number. <pre style="margin: 0;">def factorial(n): if (n==0): return 1 else return n*factorial(n-1)</pre> 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	<p>(a) What will be output after executing the following segments of code?</p> <p>i. <code>import array as arr new_arr=array('i', [1,3,89,7,88, 76]) print(res_arr=new_arr[::-1])</code></p> <p>ii. <code>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))</code></p> <p>iii. <code>import array as myarr a=myarr.array('b', [3,6,4,8,10,12,14,16,18,20]) a[8]=77 print(a)</code></p> <p>iv. <code>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)</code></p>	10
OR		
	<p>(b) Discuss the problem of removing <i>duplicates</i> 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.</p>	10
PART - B (20 Marks)		
4	Use the prime factorization and Euclidian algorithm methods to find GCD(603,72) , and write the <i>recursive</i> and <i>iterative</i> Python codes corresponding to Euclidian algorithm method.	10
5	<p>With the help of example in each case, mention the main characteristics of the following Python standard <i>random</i> module library functions.</p> <p>i. <code>random.randrange()</code></p> <p>ii. <code>random.randint()</code></p> <p>iii. <code>random.uniform()</code></p> <p>iv. <code>random.choice()</code></p> <p>v. <code>random.choices()</code></p>	10
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