Shiv Nadar University Chennai

End Semester Examinations, 2023-2024 Even

Question Paper

Name of the Program: Common to B.Tech. AI & DS, B.Tech. CSE (IoT) and B.Tech. CSE (Cyber Security)		Semester: II
Course Code & Name: CS1002 PROGRAMMING IN PYTHON		
Regulation 2021		
Time: 3 Hours		Maximum: 100 Marks

Q.No.		Questions	Marks	CO#	KL#

1		Determine the value that will be stored in the variable, "result", if the user-defined function, "calculate" multiplies the variables, "x" and "y", and adds the product with the variable, "z". Assume x = 10, y = 5 and z = 20.
		result = calculate(x, y, z) + x // y
		(a) 55 (b) 52 (c) 62 (d) 72
			1	CO1	KL2

2		Identify the output of the following lines of code: a = 10 def my_func(): global a a = 100 return a*2 print(a, my_func()) (a) 10 200 (b) 100 200 (c) 10 20 (d) Error	1	CO3	KL4
3		Determine the value of the variable "d" after the execution of the following lines of code: d = {'a':123, 'b':80, 'c':100} d.update({'a':250, 'd':345}) (a) {'a':123, 'b': 80, 'c':100} (b) {'a': 123, 'b':80, 'c':100, 'a':250, 'd':345} (c) {'a': 250, 'b': 80, 'c':100, 'd':345} (d) {'a': (123, 250) , 'b': 80, 'c':100, 'd':345}	1	CO4	KL4
4		Compare and contrast the remove() and pop() methods in Python.	2	CO4	KL2
5		Write a Python program to determine whether the user is eligible to vote based on the input name and age. Use simultaneous assignment when getting the user input.	2	CO2	KL2
6		Write a Python program that prompts the user to enter the details of a book, namely the title, the author, and the publication year. Utilize the format operator to display the details in the form "*The book [title] was written by [author] and was published in [year].*", where [title], [author], and [year] should contain the values obtained from the user.	3	CO1	KL3
7		Correct the errors in the following lines of code and determine the output produced by the code.	5	CO1	KL4

		start = 1
		while i in range(10):
		num = math.pow(start,2)/start+1
		# Note: num must be an integer
		if i == 0:
		print(1, end=" ")
		else if i % 2 == 0:
		print(num, end=" ")
		# num must be positive
		else:
		print('-'num, end=" ")
		# num must be negative
		start += 1			

8		A company pays its employees at an hourly rate and provides an overtime pay that is 1.5 times the hourly rate, for every additional hour, if an employee has worked over 40 hours. Correct the errors in the following lines of code as required to calculate the pay earned by an employee, rounded off to 2 decimal places.
		num_hr = input()
		hr = 1000
		ot = 2000
		if num_hr > 40:
		pay = num_hr * hr
		else:
		pay = 40*hr + ot*num_hr-40
			5	CO1	KL4

9		Write a Python program that prints an N-row triangular pattern composed of numbers, where N must be obtained from the user and must be between 2 and 9. For example, if $N = 4$, the triangular pattern would be as follows: 1 1 2 1 2 3 1 2 3 4	5	CO2	KL3
10		Write a program that takes two strings as input and returns a string, which is formed by swapping the first two characters of the input strings and separating the strings by a space. Ensure that the input strings have at least 3 characters and prompt the user to enter a new string, if the condition is not satisfied. Example inputs: 'Abcxy', 'def' Expected output: 'decxy Abf'	5	CO2	KL3
11		Create a function called "sum_even_numbers" that takes two parameters, "start" and "end", representing the range of numbers to consider. The function should calculate the sum of all even numbers within this range.	5	CO3	KL3

12		Demonstrate the use of list and dictionary comprehension for the following cases: i) Create a dictionary with 10 elements, where the values are the squares of the keys. ii) Create a list where each element is a character from the string, "python", converted to uppercase and repeated twice, that is, the elements should be 'PP', 'YY', 'TT', and so on.	5	CO4	KL3
13		Create a function that accepts a list of tuples as an input argument, where each tuple contains the details of an employee, namely his name, department, and salary. Find the employee that earns the highest salary and return the employee's name and salary as a tuple.	5	CO4	KL3
14		Demonstrate the use of a dictionary in the place of conditional statements, by writing a program to implement a simple calculator that takes two inputs from the user and performs addition, subtraction, multiplication, or division, as requested by the user.	5	CO4	KL3
15		Write a program that takes a text file as an input. Read only the first 2 lines and print them. Then skip the next 5 characters and print the remaining characters in that line. Finally, skip 2 lines and print the remaining lines.	5	CO5	KL3
16		Develop a Python program that prompts the user to enter two numerical values and perform division on them. Implement exception handling to address scenarios such as division by zero and non-numeric inputs. Display appropriate error messages when exceptions are caught, and if the division is successful, output the result of the division.	5	CO5	KL3
17		Employ a dictionary to store the weather data for different cities, including attributes like temperature, humidity, and weather conditions. Write a program that demonstrates the following: i) Dictionary operations, namely adding new city data, updating existing records, and searching for specific city information using keys ii) Dictionary methods, namely update(), items(), pop(), and clear() in managing and extracting the required weather data	10	CO4	KL3
18		Write a program that assists a user in creating a password. Define a function that checks if the string entered by the user is a valid password by checking the following conditions: (a) At least one lowercase alphabet is required. (b) At least one uppercase alphabet is required. (c) At least one digit is required. (d) At least one special character is required. (e) The length of the password should be between 8 and 16. If the password entered does not satisfy the above conditions, then prompt the user to enter a new password. Also, define a function to check for the strength of the password, if it is valid, as follows: (a) If the password contains at least four occurrences of conditions (a) to (d), then the password strength is "strong". (b) If the password contains two or three occurrences of conditions (a) to (d), then the password strength is "medium". (c) If the password contains only one occurrence of (d), then the password strength is "poor".	10	CO3	KL3

19		Write a Python program to accomplish the following tasks: i) Read the contents of an input file called "input_data.txt" into a list or a suitable data structure for processing. ii) Calculate the total number of words, the number of lines, and the average word length in the input data. iii) Write the calculated results, including the total number of words, number of lines, and average word length, to an output file called "output_results.txt". iv) Display a message indicating that the results have been successfully written into the output file.	10	CO5	KL3
20		Demonstrate exception handling in Python by writing a program that takes a text file as a command-line argument. a) Check if the file exists (Look for $FileNotFoundError$) and if it does not, create the file and prompt the user to enter content to write into this file. b) Remove all non-alphabetic characters from the contents of the file and find the frequency of occurrence of each word.	10	CO5	KL3

KL – Bloom's Taxonomy Levels
(KL1: Remembering, KL2: Understanding, KL3: Applying, KL4: Analyzing, KL5: Evaluating, KL6: Creating)
CO – Course Outcomes
