- *Answer all questions.*
- *Make judicious assumptions where necessary and mention them clearly.*
- *Write your codes and logic neatly so that humans can also evaluate the same* ☺

Q. No.	Question	Marks
1	You have been selected to the data science division of an Automotive Manufacturer. As directed by the management, write an algorithm describing the programming steps to meet following requirements: i. Conduct a market survey to collect the following information from prospective customers: age, gender, marital status, and the expected price of car that the customer requires. ii. With the survey details from 1000 people, evaluate the price segment to target, assuming that there are 3 price segments: <Rs 5 lakhs, Rs 5 lakhs to Rs 10 lakhs and > Rs 10 lakhs. iii. As per a previous survey, the preferences of different age-groups are as follows: 18-30: Hatchbacks, 30+: SUV (if single) and Sedan (if married). Based on the survey, predict the type of car that best fits the market assuming similar demographics as covered by the survey. Hint: *Please write the logic in legible steps without any concern about the syntax. Mention how the data will be stored and manipulated. Assume that the best fit or target will be the group opted by maximum number of people.*	5

2	Give the output of the following Python programs:
	
	 1. a,b = 10,20
	    print(a+b)
	
	 2. a=10
	    b,c = a+20,30-a
	    print(b-c)
	
	 3. a,b,c = 10,3+4j,20.0
	    print(a+c)
	    print(b+c)
	
	 4. a,b,c = "10",10,"Hello"
	    print(a+c)
	    print(b+c)
		3

3	Write a Python program to take any natural number as user input and compute its factorial.	2
4 a	Your friends launched a new stationary store near the campus that sells items like pens, books, etc. They want your help in automating the billing process. Write a Python program that gives the following functionalities: i. Prompt and take the items purchased by customer in terms of both quantity and cost/item ii. Calculate the total cost of purchased items iii. Generate the final bill by adding 18% GST to the total cost iv. Display the final bill in following format: "Dear customer, your total bill is Rs X. Please visit again." Here, X should be the final bill amount. Note: *At least two items will be purchased by any customer.* Eg: *2 pens costing Rs 10 each and 3 books costing Rs 50 each.*	3

	b	What will be the output of? i. 0.15*200+500+1200//4-(9*2+12) ii. a = "Hi\n"*2 print(a) Provide the calculation/steps involved in both cases.	

5	a	Given a Python list **candidate_list** containing names of 15 candidates contesting an election (Strings), you are given a program that generates a unique identification number for each candidate.
		
		id_no = []
		seq_no = 0
		for name in candidate_list:
		   a = str(seq_no)
		   b = 2-len(a)
		   c = name[0].upper()
		   d = 'CAN'+c+a+'2024EL'
		   print(d)
		   id_no[seq_no] = d
		   seq_no += 1
		
		i. What will be the datatype of **id_no**?
		ii. What will be the datatype of **d**?
		iii. What will be the output of print statement for seq_no=7 and name='Test'?
		iv. What will be the output of print statement for seq_no=12 and name='Check'?
		v. If **candidate_list** contains names of 125 candidates, what will be the output for seq_no=119 and name='Ob'?
			3

	b	Will the length of **d** be constant for all candidates? Explain with an example. Suggest a method of modifying **d** to keep its length constant for all candidates. You can state your logic without worrying about any programming syntax.	2

Handwritten annotations:
a = "12"
b =
c = "C"
d = CANC12 2024EL

a = "119"
c = "O"

i. (sequence no) {id}

"Hi \n new" —

end (Hi)

Hi.
new