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Daffodil International University

Faculty of Science & Information Technology
Department of Computing and Information System
Final Examination, Summer-2025
Course Code: CIS121, Course Title: Introduction to Industry 4.0
Level: 1 Term: 1

Exam Duration: 2 Hours **Marks: 40**

Answer ALL Questions

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

1. *Output Tracing:* [2.5×2 = 5] CLO1

Write the output of the following codes:

a)
```
def sum_numbers(n):
    total = 0
    for i in range(1, n+1):
        total += i
    return total
result = sum_numbers(5)
print(result)
```

b)
```
marks = {'Rakib': 85, 'Aman': 90,
'Samia': 78}

for name in marks:
    marks[name] += 5
print(marks)
```

2. CLO2

i. Two lists are defined in Python as follows:

names → ["Smartphone", "Earphones", "Backpack", "Water Bottle", "Headphones"]
shopping_amount → [12000, 1500, 8000, 400, 9000]

ii. Apply the following discount policy:

Total ≥ 15,000 BDT → 25% discount
Total 10,000–14,999 BDT → 15% discount
Total 7,500–9,999 BDT → 10% discount
Total 5,000–7,499 BDT → 5% discount
Total < 5,000 BDT → No discount

a)	**Write** a Python program to implement the above-mentioned online shopping discount policy.	[7]
b)	**Remove** items from both lists mentioned in *(i)* that have no discount and print the updated lists.	[5]
c)	**Differentiate** between Python list and tuple.	[3]

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3.	Create a Pandas DataFrame using the following student data:
	
	`Jersey_No Name Role Matches Runs Average`
	`0 75 Shakib Al Hasan All-Rounder 240 6600 37.5`
	`1 28 Tamim Iqbal Batsman 220 7800 36.2`
	`2 15 Mushfiqur Rahim Wicket-Keeper 230 6200 34.8`
	`3 30 Mahmudullah All-Rounder 200 4500 32.1`
	`4 90 Mustafizur Rahman Bowler 100 250 18.3`
	
	Now answer the following questions-
				CLO3

	a)	**Write** Python code to create & display the DataFrame.	**[5]**	
	b)	**How** can we use arrays in NumPy? Explain with an example.	**[3]**	
4.	A smart agriculture startup named **"AgriSense"** wants to monitor its farmland using sensors that measure soil moisture, temperature, humidity, sunlight, and pH levels. The collected data is sent to a centralized system where it is stored, processed, and analyzed to provide real-time insights for irrigation, fertilization, and crop management. Farmers can access this information through a web or mobile platform, receiving alerts, dashboards, and notifications about soil conditions, weather forecasts, and crop health. By combining the data-gathering sensors with the centralized management system, AgriSense can make better decisions for crop scheduling, resource optimization, and farm operations. This approach reduces manual monitoring, improves crop yield, optimizes resource use, and enables scaling across multiple farms while keeping sensitive data secure, creating a smart and efficient farming ecosystem.			**CLO3**
	a)	**Recommend** a technology for AgriSense to manage farmland data remotely and explain its benefits.	**[4]**	
	b)	**Suggest** a suitable technology to collect and transmit farmland data and describe its use.	**[4]**	
	c)	**Propose** how both technologies can assist in making better decisions for crop and farm management.	**[4]**	