



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.	<p><u>Output Tracing:</u></p> <p>Write the output of the following codes:</p> <table><tr><td><pre>a) def sum_numbers(n): total = 0 for i in range(1, n+1): total += i return total result = sum_numbers(5) print(result)</pre></td><td><pre>b) marks = {'Rakib': 85, 'Aman': 90, 'Samia': 78} for name in marks: marks[name] += 5 print(marks)</pre></td></tr></table>	<pre>a) def sum_numbers(n): total = 0 for i in range(1, n+1): total += i return total result = sum_numbers(5) print(result)</pre>	<pre>b) marks = {'Rakib': 85, 'Aman': 90, 'Samia': 78} for name in marks: marks[name] += 5 print(marks)</pre>	[2.5×2 = 5]	CLO1
<pre>a) def sum_numbers(n): total = 0 for i in range(1, n+1): total += i return total result = sum_numbers(5) print(result)</pre>	<pre>b) marks = {'Rakib': 85, 'Aman': 90, 'Samia': 78} for name in marks: marks[name] += 5 print(marks)</pre>				
2.	<p>i. Two lists are defined in Python as follows:</p> <p>names → ["Smartphone", "Earphones", "Backpack", "Water Bottle", "Headphones"]</p> <p>shopping_amount → [12000, 1500, 8000, 400, 9000]</p> <p>ii. Apply the following discount policy:</p> <p>Total ≥ 15,000 BDT → 25% discount</p> <p>Total 10,000–14,999 BDT → 15% discount</p> <p>Total 7,500–9,999 BDT → 10% discount</p> <p>Total 5,000–7,499 BDT → 5% discount</p> <p>Total < 5,000 BDT → No discount</p>		CLO2		
	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]			

3.	<p>Create a Pandas DataFrame using the following student data:</p> <table><tr><th></th><th>Jersey_No</th><th>Name</th><th>Role</th><th>Matches</th><th>Runs</th><th>Average</th></tr><tr><td>0</td><td>75</td><td>Shakib Al Hasan</td><td>All-Rounder</td><td>240</td><td>6600</td><td>37.5</td></tr><tr><td>1</td><td>28</td><td>Tamim Iqbal</td><td>Batsman</td><td>220</td><td>7800</td><td>36.2</td></tr><tr><td>2</td><td>15</td><td>Mushfiqur Rahim</td><td>Wicket-Keeper</td><td>230</td><td>6200</td><td>34.8</td></tr><tr><td>3</td><td>30</td><td>Mahmudullah</td><td>All-Rounder</td><td>200</td><td>4500</td><td>32.1</td></tr><tr><td>4</td><td>90</td><td>Mustafizur Rahman</td><td>Bowler</td><td>100</td><td>250</td><td>18.3</td></tr></table> <p>Now answer the following questions-</p> <table><tr><td>a)</td><td>Write Python code to create & display the DataFrame.</td><td>[5]</td></tr><tr><td>b)</td><td>How can we use arrays in NumPy? Explain with an example.</td><td>[3]</td></tr></table>		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	a)	Write Python code to create & display the DataFrame.	[5]	b)	How can we use arrays in NumPy? Explain with an example.	[3]	CLO3
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4.	<p>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.</p> <table><tr><td>a)</td><td>Recommend a technology for AgriSense to manage farmland data remotely and explain its benefits.</td><td>[4]</td></tr><tr><td>b)</td><td>Suggest a suitable technology to collect and transmit farmland data and describe its use.</td><td>[4]</td></tr><tr><td>c)</td><td>Propose how both technologies can assist in making better decisions for crop and farm management.</td><td>[4]</td></tr></table>	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]	CLO3																																							
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