CODING CONTEST PAPER (50 MARKS)

Instructions for Students

- **Total Marks:** 50
- **Answer all questions.**
- **Attach your code for coding questions in a separate document (include code and output screenshot).**
- **Mention your name and student ID on every page.**

Section A: Match the Column (10 Marks, 2×5)

Match the following terms in Column A with their correct description in Column B.

Column A	Column B
A1. DataFrame	1. Converts string to integer in Python
A2. `np.array([1,2,3])`	2. Returns True if both conditions are true
A3. `int("12")`	3. Used to store tabular data in pandas
A4. Logical AND Operator	4. Used to store 1D or 2D arrays in NumPy
A5. `df.head()`	5. Shows first few rows of a DataFrame

Write the correct pair (e.g., A1–3, A2–4, etc.)

Section B: True or False (1×5 = 5 Marks)

State whether the following statements are True or False:

1. Pandas DataFrames can only store integer data.
2. `np.mean()` returns the sum of an array.
3. In Python, `if` statements can be nested inside each other.
4. `df.info()` in pandas shows information about the DataFrame.
5. The result of `3 > 2 and 2 > 1` is `True`.

Section C: Fill in the Blanks (1×5 = 5 Marks)

1. To create a NumPy array, we use `np._____([1, 2, 3])`.
2. To convert a string `"15"` to integer, use `_____("15")`.
3. The logical OR operator in Python is written as `____`.
4. To get the last 3 rows of a DataFrame `df`, use `df.____(3)`.
5. To add two numbers `a` and `b`, use the operator `____`.

Section D: Theory Questions (2×5 = 10 Marks)

Answer in 3–4 sentences:

1. What is a DataFrame in pandas? Give a real-life example of where it can be used.
2. Explain the difference between `if` and `elif` in Python.
3. What is an aggregate function in NumPy? Name any two aggregate functions.
4. Why is type conversion important in Python? Give an example.
5. How can you inspect the structure of a DataFrame in pandas?

Section E: Coding Questions (20 Marks)

Q1. (4 marks)

Create a NumPy array with values from 1 to 10. Find the mean, maximum, and minimum of the array. Print each result.

- Attach your code and output.

Q2. (4 marks)

Write a Python code that takes an integer input from the user, and checks if the number is even or odd using if-else. Print "Even" or "Odd" as output.

- Attach your code and output.

Q3. (4 marks)

Create a pandas DataFrame with columns "Product" (Rice, Sugar, Oil), and "Price" (50, 40, 100). Display the first row and use pandas to find the average price.

- Attach your code and output.

Q4. (4 marks)

Given a NumPy array `arr = np.array([3, 8, 1, 6, 0, 7])` **, write code to count how many elements are greater than 4.**

- Attach your code and output.

Q5. (4 marks)

Write Python code to check if a given number is positive, negative, or zero using if-elif-else statements. Print the result.

- Attach your code and output.

Instructions for Instructors:

1. **Create a new document (PDF or Word) for each student submission.**
2. **For coding questions:**
    - Student must paste code AND attach a screenshot of their output.
    - Award full marks only if both code and correct output are present.

3. **Check theory questions for understanding and clarity.**
4. **Total the marks clearly at the top of the student's submission.**
5. **If any question is left, mention "Not Attempted" and give zero marks for that question.**

Sample Answers (For Instructor Reference Only)

Section A:

A1-3, A2-4, A3-1, A4-2, A5-5

Section B:

1. False
2. False
3. True
4. True
5. True

Section C:

1. array
2. int
3. or
4. tail
5.
    -

Section D:

1. A DataFrame is a 2D tabular data structure in pandas, like an Excel sheet. It can store rows and columns of data and is useful for analyzing sales data in a

shop.

2. `if` checks a condition and runs code if it's true. `elif` lets you check extra conditions if the first `if` was false.
3. Aggregate functions process array data and give one value as a result, e.g., `mean()` (average), `sum()` (total).
4. Type conversion changes data from one type to another (like string to int). It's important to do math or compare numbers, e.g., `int("10")`.
5. Use `df.info()` or `df.head()` to see the structure and first rows of a DataFrame.

Section E: Coding Questions (20 Marks)

Q1. (4 marks)

Create a NumPy array containing the values from 1 to 10. Write code to:

- Calculate and print the mean (average) of the array.
- Find and print the maximum and minimum values in the array.
- Attach your code and a screenshot of the output.

Q2. (4 marks)

Write a Python program that:

- Takes an integer input from the user.
- Checks whether the number is even or odd using `if-else` statements.
- Prints "Even" if the number is even, and "Odd" if the number is odd.
- Attach your code and a screenshot of the output.

Q3. (4 marks)

Using pandas:

- Create a DataFrame with two columns: "Product" (containing Rice, Sugar, Oil) and "Price" (containing 50, 40, 100).
- Display the first row of the DataFrame.

- Calculate and print the average price of all products.
- Attach your code and a screenshot of the output.

Q4. (4 marks)

Given a NumPy array `arr = np.array([3, 8, 1, 6, 0, 7])`:

- Write code to count how many elements in the array are greater than 4.
- Print the count as the output.
- Attach your code and a screenshot of the output.

Q5. (4 marks)

Write a Python program that:

- Takes a number as input from the user.
- Uses `if`, `elif`, and `else` statements to check if the number is positive, negative, or zero.
- Prints the result as "Positive", "Negative", or "Zero".
- Attach your code and a screenshot of the output.
