

Q U I Z

NumPy & Pandas

Python Data Science Series

STUDENT INFORMATION

FULL NAME

Aditya Kumar

CLASS / SECTION

ROLL NUMBER

Date: _____ 23 Feb 2026 _____

Total Marks: ____ / 30

SECTION 1

NumPy Arrays & Operations

Questions 1–5 · Broadcasting, Indexing & Numerical Computing

5 Questions × 1 Mark = 5 Marks

What does the following NumPy operation return?
`np.array([1, 2, 3]) * 3`

A [3, 6, 9]

B [1, 2, 3, 1, 2, 3, 1, 2, 3]

C [3, 3, 3]

D Error – cannot multiply array by scalar

Answer: ___A___

Which of the following NumPy array shapes are broadcast-compatible?

A (3, 4) and (5, 4)

B (3,) and (3, 3)

C (4, 1) and (1, 4)

D Both B and C

Answer: ____D____

Given `arr = np.array([[1,2,3],[4,5,6],[7,8,9]])`, what does `arr[1:, ::2]` return?

A `[[4, 6], [7, 9]]`

B `[[4, 5, 6], [7, 8, 9]]`

C `[[4, 6], [7, 9]]`

D `[[5, 6], [8, 9]]`

Answer: __C__

Which NumPy function computes the dot product of two 1-D arrays?

A `np.multiply()`

B `np.dot()`

C `np.cross()`

D `np.sum()`

Answer: __A__

What is the output of `np.arange(2, 10, 3)`?

A`[2, 5, 8, 11]`**B**`[2, 5, 8]`**C**`[3, 6, 9]`**D**`[2, 4, 6, 8]`

Answer: _B_____

SECTION 2

Pandas — Series & DataFrames

Questions 6–12 · Data Loading, Filtering, Sorting & Wrangling

7 Questions × 1 Mark = 7 Marks + 3 Short Answer × 2 Marks = 6 Marks

Which Pandas method is used to read a CSV file into a DataFrame?

A `pd.read_table()`

B `pd.read_csv()`

C `pd.load_csv()`

D `pd.import_csv()`

Answer: __B__

Which parameter in `pd.read_excel()` specifies which sheet to load?

A tab_name

B sheet_index

C sheet_name

D worksheet

Answer: __C__

Given df with a column 'Age', which expression filters rows where Age > 25?

A`df[df.Age > 25]`**B**`df.filter(Age > 25)`**C**`df.where('Age > 25')`**D**`df.query['Age > 25']`

Answer: __A__

Which method sorts a DataFrame by the 'Score' column in descending order?

A `df.sort('Score', desc=True)`

B `df.order_by('Score', ascending=False)`

C `df.sort_values('Score', ascending=False)`

D `df.arrange('Score', reverse=True)`

Answer: __C__

What does `df.groupby('Dept')['Salary'].mean()` return?

A A single mean salary value

B Mean salary grouped by department

C Mean salary of the 'Dept' column

D Error – cannot group then mean

Answer: ____B____

Which method combines two DataFrames horizontally (column-wise)?

A`pd.concat([df1, df2], axis=0)`**B**`pd.concat([df1, df2], axis=1)`**C**`df1.append(df2)`**D**`pd.merge(df1, df2, how='outer')`

Answer: ____B____

What does `df.dropna()` do to a DataFrame?

A Drops all columns with NaN values

B Fills NaN values with 0

C Drops all rows containing NaN values

D Replaces NaN with the column mean

Answer: ____C____

SHORT ANSWER

Explain the split-apply-combine strategy used by `groupby()` in Pandas. Provide a real-world example showing how `groupby()` with an aggregation function is used.

Answer: It is widely used in **corporate analytics, dashboards, finance reports, HR analysis, sales reporting**, etc.

It is used the split apply combine method to manipulate the data.

```
import pandas as pd
```

```
data = {  
    "Employee": ["Aditya", "Rahul", "Priya", "Sneha", "Aman", "Neha"],  
    "Department": ["Sales", "HR", "IT", "Finance", "Sales", "IT"],  
    "Score": [95, 88, 92, 75, 98, 85]  
}
```

```
df = pd.DataFrame(data)
```

SHORT ANSWER

What is broadcasting in NumPy? State the broadcasting rules and give an example showing how arrays of shapes (3, 1) and (1, 4) would interact.

Answer: **Broadcasting** is a powerful NumPy mechanism that allows arrays of **different shapes** to perform arithmetic operations **without explicitly reshaping them**.

```
import numpy as np
```

```
A = np.array([[1],  
              [2],  
              [3]]) # Shape (3,1)
```

```
B = np.array([[10, 20, 30, 40]]) # Shape (1,4)
```

```
result = A + B  
print(result)
```

SHORT ANSWER

Describe any TWO common data-wrangling tasks in Pandas. For each task, name the method used and write a one-line code example.

Answer : Handling Missing Values

Fill or manage missing (NaN) values in a dataset.

```
df["Salary"] = df["Salary"].fillna(df["Salary"].mean())
```

Grouping and Aggregation

Summarize data based on categories.

`groupby()` with aggregation (`mean()`, `sum()`, etc.)

```
df.groupby("Department")["Score"].mean()
```

END OF QUIZ

Please review all answers before submitting.

Section	Topic	Questions	Marks
Section 1	NumPy Arrays & Operations	Q1–Q5	5 Marks
Section 2	Pandas MCQ	Q6–Q12	7 Marks
Section 2	Short Answer	Q13–Q15	6 Marks
TOTAL			30 Marks