Python Evaluation Exam

Section 1: Core Python (Coding Tasks)

Q1. File Handling & Data Processing

You are given a log file `server.log` with entries like:
2025-09-24 10:05:23, INFO, User=harshal, Action=Login
2025-09-24 10:15:40, ERROR, User=manish, Action=PaymentFailed
2025-09-24 10:25:10, INFO, User=suvarna, Action=Logout

Write a Python script to:
1. Count total number of `ERROR` logs.
2. Extract unique users who have logged in.
3. Save the results in a JSON file (`result.json`).

Q2. OOP & Inheritance

Create a class `Employee` with attributes `name`, `salary`, and `department`.
- Add a method to display employee details.
- Create a subclass `Developer` with an extra attribute `programming_language`.
- Create another subclass `Tester` with an extra attribute `testing_tool`.
- Instantiate objects for both classes and display details.

Q3. Exception Handling & Debugging

The following code has multiple issues. Fix them and make it work properly:

```
def divide(a, b):
   return a/b

numbers = [(10, 2), (5, 0), ("8", 4)]

for x, y in numbers:
   print(f"Result: {divide(x, y)}")
```

Expected output:
Result: 5.0
Error: Division by zero
Error: Invalid input types

Section 2: Data Handling & Libraries

Q4. Pandas Data Analysis

Given a CSV file `sales.csv` with the following columns:
`Date, Product, Quantity, Price`

Tasks:
1. Load the CSV using pandas.
2. Find the total revenue per product.
3. Find the best-selling product (by quantity).
4. Save results to `sales_summary.csv`.

Q5. API Integration

Write a Python script that fetches data from this API:
https://jsonplaceholder.typicode.com/posts

- Print the title of all posts written by `userId=1`.
- Save the filtered posts to `user1_posts.json`.

Section 3: Advanced Concepts

Q6. Decorators

Create a decorator `time_logger` that measures and prints the execution time of any function.
- Use it on a function that calculates the sum of numbers from 1 to 1,000,000.

Q7. Generators

Write a generator function `fibonacci(n)` that yields the first `n` Fibonacci numbers.
- Print the first 10 numbers using the generator.

Q8. Database Handling

Using sqlite3:
- Create a database `company.db` with a table `employees(id, name, role, salary)`.
- Insert 3 employee records.
- Write a query to fetch all employees with salary > 50,000.

Section 4: Problem-Solving

Q9. Algorithm

Write a function `two_sum(nums, target)` that returns indices of two numbers in the list `nums` that add up to the given `target`.

Example:
nums = [2, 7, 11, 15]
target = 9
print(two_sum(nums, target)) # Output: (0, 1)

Q10. Real-World Task

Write a script that:
1. Reads a text file `input.txt`.
2. Removes all stopwords (`the, is, in, and, of, to, a`).
3. Counts the frequency of each remaining word.
4. Saves the top 5 most frequent words in `output.txt`.