Intermediate Pandas Coding Questions

1. **How do you merge two DataFrames `df1` and `df2` on the `ID` column, keeping all rows from `df1` and matching rows from `df2`?**
2. **Create a DataFrame with columns `Product`, `Sales`, and `Date`. Use `groupby` to calculate the total `Sales` for each `Product`.**
3. **Read a CSV file `employee_data.csv` into a DataFrame and perform a groupby operation to find the average `Salary` by `Department`.**
4. **Create a DataFrame with columns `Employee_ID`, `Start_Date`, and `End_Date`. Calculate the duration of each employeeâ€™s tenure in days.**
5. **Given a DataFrame with `Date` and `Value` columns, resample the data to show quarterly summaries of `Value`.**
6. **Use the `apply` method to create a new column `Discounted_Price` by applying a discount function to the `Price` column.**
7. **Create a pivot table from a DataFrame with `Product`, `Region`, and `Revenue` columns. Show the sum of `Revenue` for each `Product` in each `Region`.**
8. **Normalize the `Score` column in a DataFrame to have values between 0 and 1.**
9. **Combine two DataFrames with the same columns but different rows using `concat()`.**
10. **Use the `transform` method to calculate the z-score of the `Sales` column in a DataFrame.**
11. **Filter a DataFrame to include rows where the `Date` column is between `2023-01-01` and `2023-12-31`.**
12. **Write a function to categorize `Age` into bins (e.g., `Young`, `Middle-aged`, `Senior`) and apply it to a DataFrame.**
13. **Use the `groupby` method to find the median value of `Score` for each `Group` in a DataFrame.**
14. **Create a DataFrame with columns `Name`, `Marks`, and `Pass_Fail`. Use `np.where` to populate `Pass_Fail` as 'Pass' if `Marks` > 50, else 'Fail'.**
15. **Find and fill missing values in the `Temperature` column with the mean temperature from the previous 7 days.**
16. **Perform a left join between a DataFrame of orders and a DataFrame of products on the `Product_ID` column.**
17. **Create a DataFrame with `Date`, `Sales`, and `Profit`. Calculate the rolling mean of `Sales` with a window size of 30 days.**
18. **Split a DataFrame into multiple DataFrames based on the unique values in the `Category` column.**
19. **Create a DataFrame with `Date` and `Value` columns. Use `shift()` to compute the difference between the current and previous values.**
20. **Extract the year, month, and day from a `Date` column and create new columns `Year`, `Month`, and `Day` in a DataFrame.**