**Set and Dictionary Interview Questions – Problem Statements and Explanations**

### Set-Based Questions

**1. Add Element to a Set**  
**Problem:** Add an item to a given set.  
**Explanation:** Use add() method.  
**Input:** {1, 2, 3}, add 4  
**Output:** {1, 2, 3, 4}

**2. Remove Element from Set**  
**Problem:** Remove a specific element from a set.  
**Explanation:** Use remove() or discard() to avoid KeyError.  
**Input:** {1, 2, 3}, remove 2  
**Output:** {1, 3}

**3. Union of Two Sets**  
**Problem:** Find union of two sets.  
**Explanation:** Use | operator or union() method.  
**Input:** {1, 2}, {2, 3}  
**Output:** {1, 2, 3}

**4. Intersection of Sets**  
**Problem:** Find common elements in two sets.  
**Explanation:** Use & operator or intersection().  
**Input:** {1, 2}, {2, 3}  
**Output:** {2}

**5. Difference of Sets**  
**Problem:** Elements present in first set but not in second.  
**Explanation:** Use - or difference() method.  
**Input:** {1, 2, 3}, {2, 3}  
**Output:** {1}

**6. Check Subset**  
**Problem:** Check if one set is a subset of another.  
**Explanation:** Use issubset() method.  
**Input:** {1, 2}, {1, 2, 3}  
**Output:** True

**7. Set Length**  
**Problem:** Find number of elements in set.  
**Explanation:** Use len().  
**Input:** {1, 2, 3}  
**Output:** 3

**8. Clear a Set**  
**Problem:** Remove all elements from a set.  
**Explanation:** Use clear().  
**Input:** {1, 2, 3}  
**Output:** set()

**9. Symmetric Difference**  
**Problem:** Find elements in either set but not in both.  
**Explanation:** Use ^ or symmetric\_difference()  
**Input:** {1, 2, 3}, {2, 3, 4}  
**Output:** {1, 4}

**10. Convert List to Set**  
**Problem:** Remove duplicates using set.  
**Explanation:** Use set() constructor.  
**Input:** [1, 2, 2, 3]  
**Output:** {1, 2, 3}

### Dictionary-Based Questions

**11. Create a Dictionary from Two Lists**  
**Problem:** Combine two lists into a dictionary.  
**Explanation:** Use zip() function.  
**Input:** ["a", "b"], [1, 2]  
**Output:** {"a": 1, "b": 2}

**12. Update Dictionary Value**  
**Problem:** Change value for a specific key.  
**Explanation:** Use assignment dict[key] = value.  
**Input:** {"a": 1}, update a to 2  
**Output:** {"a": 2}

**13. Remove Key from Dictionary**  
**Problem:** Delete a key-value pair.  
**Explanation:** Use del or pop() method.  
**Input:** {"a": 1, "b": 2}, remove b  
**Output:** {"a": 1}

**14. Check Key Existence**  
**Problem:** Verify if a key exists.  
**Explanation:** Use in operator.  
**Input:** {"x": 1}, key = "x"  
**Output:** True

**15. Iterate Over Dictionary**  
**Problem:** Print all keys and values.  
**Explanation:** Use .items() in loop.  
**Input:** {"a": 10, "b": 20}  
**Output:** a 10, b 20

**16. Dictionary Length**  
**Problem:** Count total key-value pairs.  
**Explanation:** Use len() function.  
**Input:** {"x": 1, "y": 2}  
**Output:** 2

**17. Merge Two Dictionaries**  
**Problem:** Combine two dictionaries.  
**Explanation:** Use unpacking or update().  
**Input:** {"a": 1}, {"b": 2}  
**Output:** {"a": 1, "b": 2}

**18. Get Value with Default**  
**Problem:** Get value or default if key not found.  
**Explanation:** Use get() method.  
**Input:** {"a": 1}, get "b" with default 0  
**Output:** 0

**19. Count Frequency of Elements**  
**Problem:** Count frequency using dictionary.  
**Input:** [1, 2, 2, 3]  
**Output:** {1: 1, 2: 2, 3: 1}

**20. Invert a Dictionary**  
**Problem:** Flip keys and values.  
**Input:** {"a": 1, "b": 2}  
**Output:** {1: "a", 2: "b"}

**21. Find Key with Maximum Value**  
**Problem:** Identify the key with the highest value.  
**Input:** {"a": 10, "b": 20, "c": 15}  
**Output:** "b"

**22. Sort Dictionary by Values**  
**Problem:** Sort a dictionary based on its values.  
**Input:** {"a": 3, "b": 1, "c": 2}  
**Output:** [('b', 1), ('c', 2), ('a', 3)]

**23. Create Dictionary of Squares**  
**Problem:** Create dictionary where keys are numbers and values are their squares.  
**Input:** range(1, 4)  
**Output:** {1: 1, 2: 4, 3: 9}

**24. Filter Dictionary by Value Condition**  
**Problem:** Retain only items with value greater than a threshold.  
**Input:** {"a": 10, "b": 5, "c": 15}, condition: > 10  
**Output:** {"c": 15}

**25. Combine Values of Duplicate Keys**  
**Problem:** Given two dictionaries, add values of common keys.  
**Input:** {"a": 1, "b": 2}, {"a": 3, "c": 4}  
**Output:** {"a": 4, "b": 2, "c": 4}

**26. Count Word Frequency in Sentence**  
**Problem:** Count occurrences of each word in a string.  
**Input:** "apple banana apple"  
**Output:** {"apple": 2, "banana": 1}

**27. Remove Duplicate Values from Dictionary**  
**Problem:** Remove duplicate values keeping first key only.  
**Input:** {"a": 1, "b": 2, "c": 1}  
**Output:** {"a": 1, "b": 2}

**28. Find Common Keys in Two Dictionaries**  
**Problem:** Return keys common to both dictionaries.  
**Input:** {"a": 1, "b": 2}, {"b": 3, "c": 4}  
**Output:** ["b"]

**29. Swap Keys and Values Safely**  
**Problem:** Flip keys and values ensuring all values are unique.  
**Input:** {"x": 1, "y": 2}  
**Output:** {1: "x", 2: "y"}

**30. Delete Items by Value**  
**Problem:** Remove key-value pairs with specific value.  
**Input:** {"a": 1, "b": 2, "c": 1}, value: 1  
**Output:** {"b": 2}

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