Basic DSA Question Set

Duration – 60 to 90 min practice
Goal – Test clarity in DSA logic, dry-run skill, & concept application.

Section 1 – Array & List Questions

No	Problem Statement	Focus	SME Observation
1	Find the **maximum** element in an array.	Traversal	Explain with variable update logic.
2	Find **second largest** element without sorting.	Two variable logic	Check for duplicates.
3	Reverse an array in place.	Index swapping	Ask “how many iterations?”
4	Count **even** & **odd** elements.	Conditional check	Test modulus use.
5	Find **sum** & **average** of elements.	Loop & arithmetic	Stress on integer vs float division.
6	Find **duplicates** in list.	Set logic	Ask for O(n) explanation.
7	Rotate array right by K.	Slicing	Check for k > len(arr).
8	Find **missing number** in 1…n series.	Math sum	Simple formula logic.
9	Merge two sorted lists.	Two-pointer	Dry-run expected.
10	Find pair with given sum.	Nested loop	Check loop termination clarity.

Section 2 – Stack and Queue

No	Problem Statement	Concept	SME Focus
11	Implement **stack** using list.	LIFO	Use append & pop().
12	Push 3 elements and pop one — predict top.	Dry-run	Trace output sequence.
13	Implement **queue** using deque.	FIFO	Check append/popleft().
14	Simulate **undo feature** using stack.	Application	Encourage real-world mapping.
15	Differentiate Stack vs Queue.	Concept	Order of deletion focus.

Section 3 – Recursion Basics

No	Problem	Concept	SME Tip
16	Find factorial using recursion.	Base condition	Ask “What if base missing?”
17	Generate Fibonacci series recursively.	Multiple calls	Explain stack depth.
18	Sum of first n natural numbers (recursion).	Backtracking sum	Trace recall order.
19	Check if string is palindrome recursively.	Two-pointer logic	Explain termination.
20	Find power(a,b) recursively.	Divide & conquer	Simplify formula.

Section 4 – Searching & Sorting

No	Problem	Focus	SME Angle
21	Perform **linear search** for target.	O(n) logic	Ask index trace.
22	Perform **binary search** (manual code).	Mid update	Explain sorted requirement.
23	Trace bubble sort for 5 elements.	Swap count	Check outer-loop runs.
24	Explain selection sort.	Concept	Describe min-swap logic.
25	Write one pass of insertion sort.	Dry-run	Understand shift.
26	Count comparisons in bubble sort (n=4).	Formula	Answer 6.
27	Differentiate Linear vs Binary search.	Theory	Sorted data condition.
28	When to prefer bubble sort?	Concept	For small datasets only.

Section 5 – Mini Real-World DSA (eCommerce Context)

No	Scenario	Logic	What SME Wants
29	Maintain cart items → Which DS to use?	List	Explain dynamic size.
30	Undo last product added to cart.	Stack	Use pop().
31	Serve customer requests in order.	Queue	FIFO behavior.
32	Track order history chronologically.	Queue / List	Insertion logic.
33	Find top 3 selling products.	Sorting / heap	Conceptual clarity.
34	Display category tree on site.	Recursion / Tree	Explain parent-child logic.