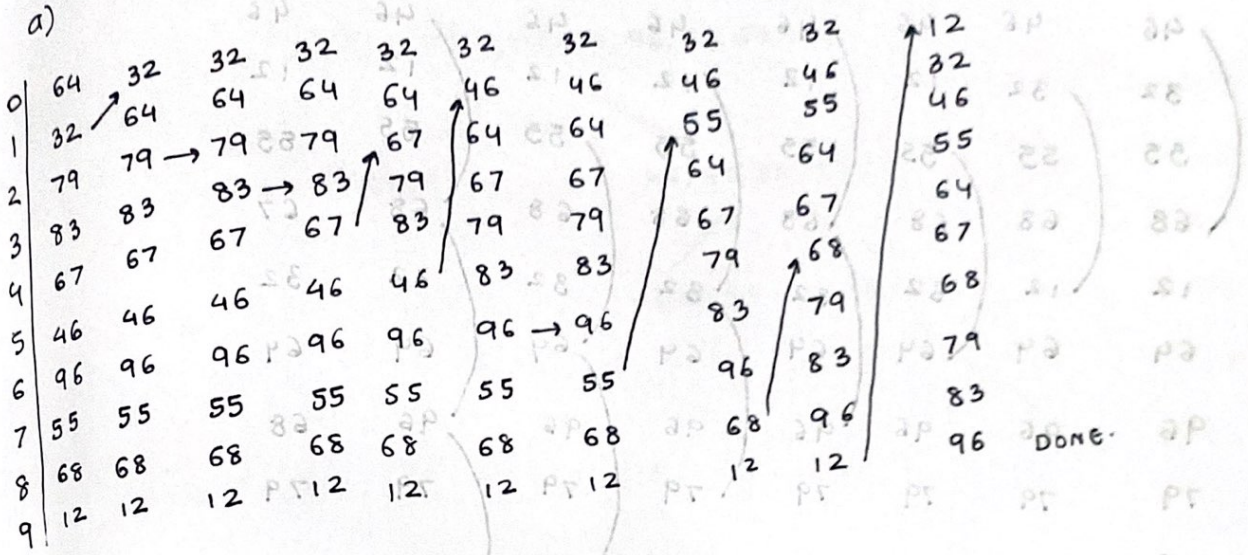
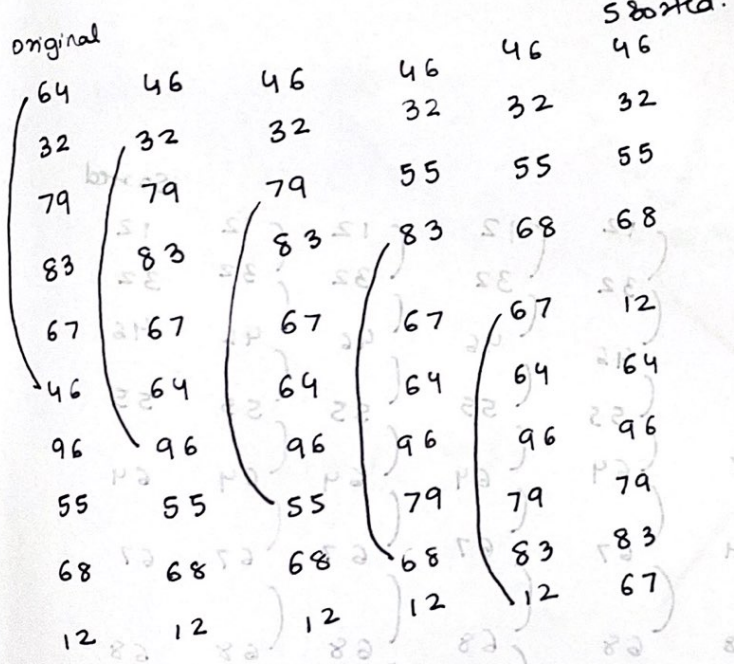
Q1)

a)



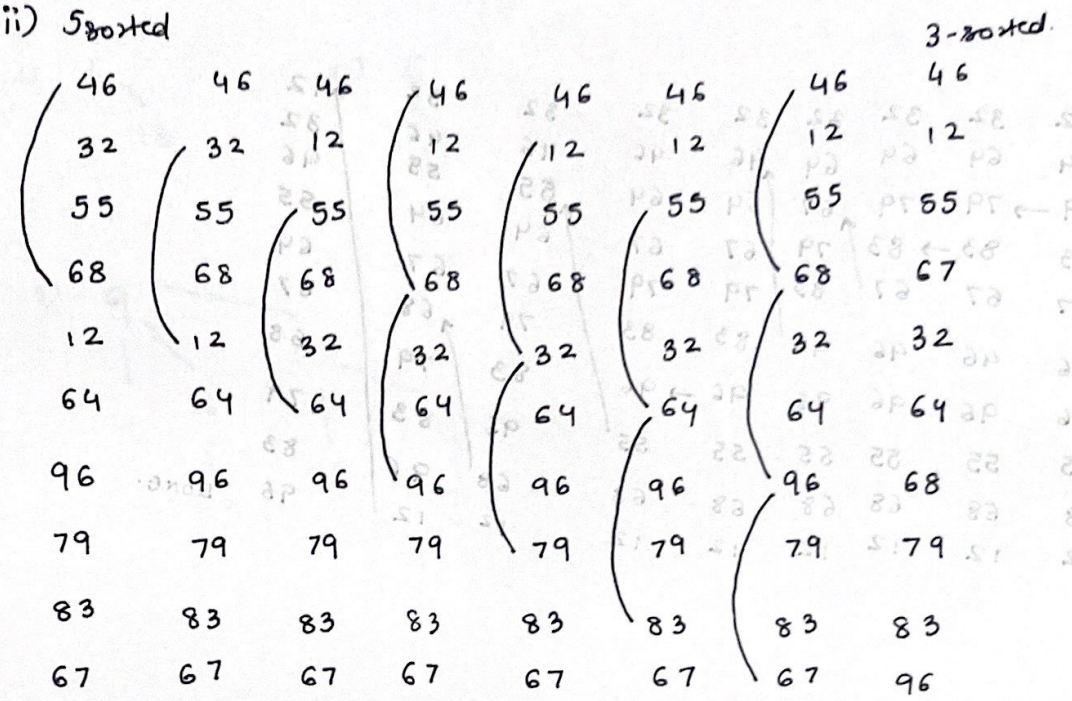
b)

i) 5 sorting

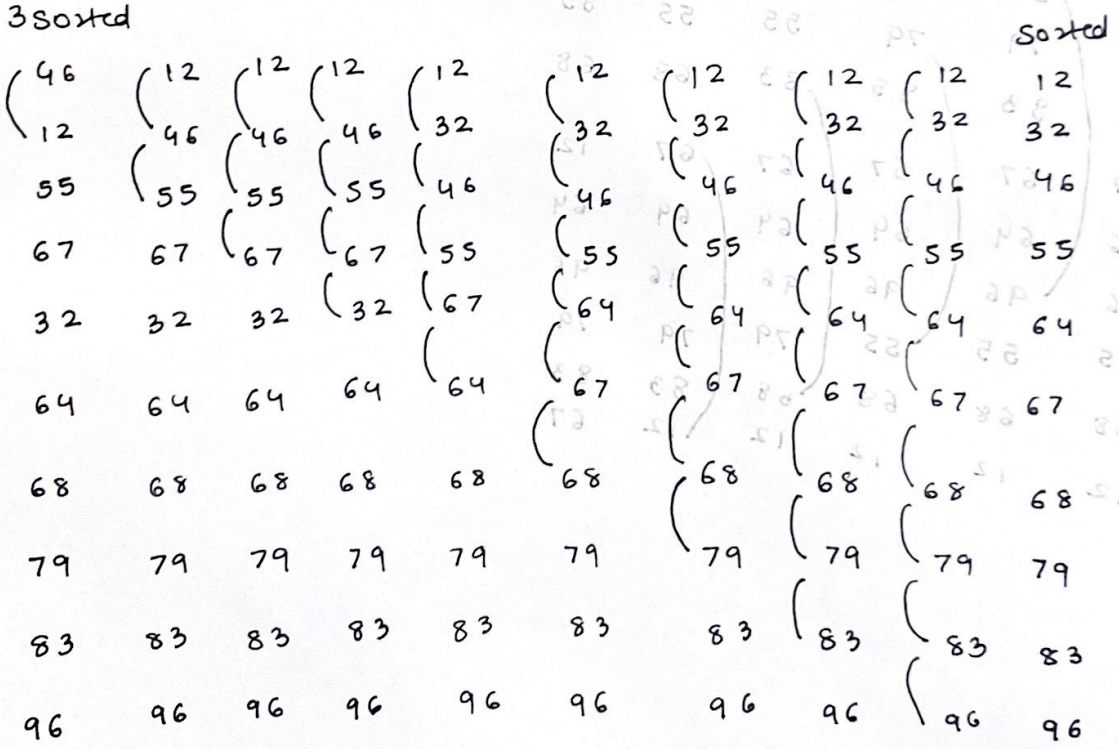


3-sorting

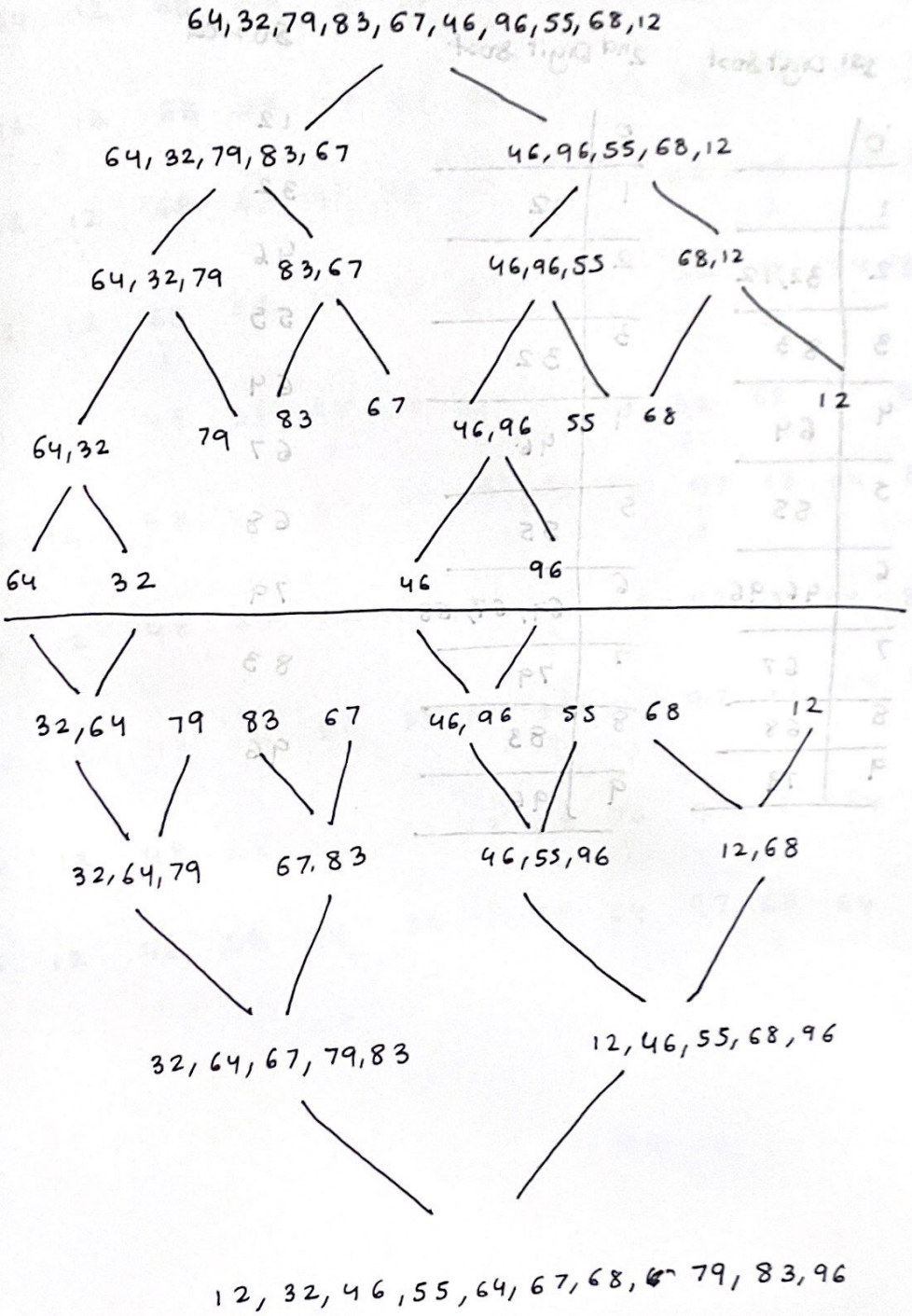
ii) 5-sorted



iii) 1 sorting.



c) Merge Sort


64,32,79,83,67,46,96,55,68,12
64,32,79,83,67
46,96,55,68,12
64,32,79
83,67
46,96,55
68,12
64,32
79
83
67
46,96
55
68
12
64
32
46
96
32,64
79
83
67
46,96
55
68
12
32,64,79
67,83
46,55,96
12,68
32,64,67,79,83
12,46,55,68,96
12,32,46,55,64,67,68,79,83,96

d) Radix sort

Original	1st Digit Sort		2nd Digit Sort		Sorted
64	0		0		12
32	1		1	12	32
79	2	32, 12	2		46
83	3	83	3	32	55
67	4	64	4	46	64
46	5	55	5	55	67
96	6	46, 96	6	64, 67, 68	68
55	7	67	7	79	79
68	8	68	8	83	83
12	9	79	9	96	96

Q2)

Step 1:-

64 12 68 23 97 38 81 76 55 32 48 29 46

46 12 68 23 97 38 64 76 55 32 48 29 81 pivot=64

46 12 68 23 97 38 29 76 55 32 48 64 81
i j

46 12 68 23 97 38 29 76 55 32 48 64 81
i j

46 12 48 23 97 38 29 76 55 32 68 64 81
i j

46 12 48 23 32 38 29 76 55 97 68 64 81
i j

46 12 48 23 32 38 29 76 55 97 68 64 81
i j

46 12 48 23 32 38 29 55 76 97 68 64 81
i j

46 12 48 23 32 38 29 55 76 97 68 64 81
j i

46 12 48 23 32 38 29 55 64 97 68 64 81

Step 2:-

46 12 48 23 32 38 29 55 97 68 76 81

23 12 48 46 32 38 29 55 68 81 76 97

23 12 48 29 32 38 46 55 68 76 81 97
i j partition <= 3

23 12 48 29 32 38 46 55 68 76 81 97
i j

23 12 38 29 32 48 46 55
i j

23 12 38 29 32 48 46 55
j i

23 12 38 29 32 46 48 55

Step 3:

23 12 38 29 32

23 12 32 29 38

23 12 29 32 38

list size <= 3

12 23 29

Result:

12 23 29 32 38 46 48 55 64 68 76 81 97

Q3)

8	0	
7	1	
4	2	2
2	3	
5	4	2
5	5	3
2	6	
4	7	2
5	8	2
7	9	
8		

sorted

2
2
4
4
5
5
5
7
7
8
8

Q4)

T1 10 1 5 2 6 8 4 10 6 6 2 4 1 8 7 3

T2

T3 1 2 5 10 2 4 6 6

T4 4 6 8 10 1 3 7 8

T1 1 2 4 5 6 8 10 10

T2 1 2 3 4 6 6 7 8

T3 1 1 2 2 3 4 4 5 6 6 6 7 8 8 10 10

Q5

Input	Memory (holds 3)			Output
				Run 1
10	10			1
1	10	1		2
5	10	1	5	5
	10	2	5	6
2	10	6	5	8
6	10	6	8	10
8	10	4*	8	10
4	10	4*	10	
10	6*	4*	10	Run 2
6	6*	4*	6*	4
6	6	2*	6	6
2	4*	2*	6	6
4	4*	2*	1*	Run 3
1	4	2	8	1
8	4	7	8	2
7		7	8	4
			8	7
				8

Q 6

4 items in list = 4! arrangements.

∴ depth = log(4!) depth

* [log(4!)] = 5 comparison