Title: Balanced Search Trees Hashing and Graphs

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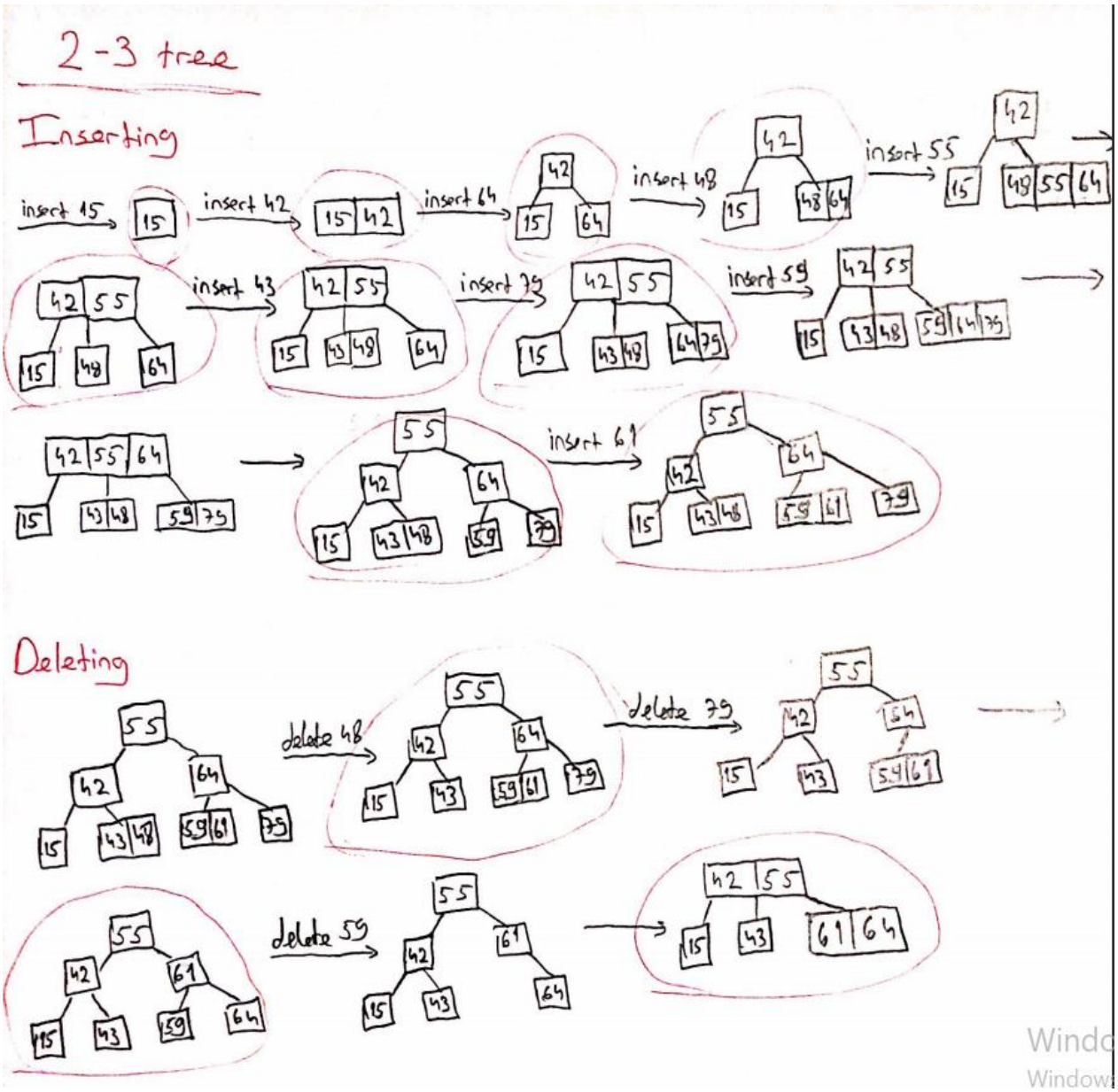
Section: 1

Assignment: 4

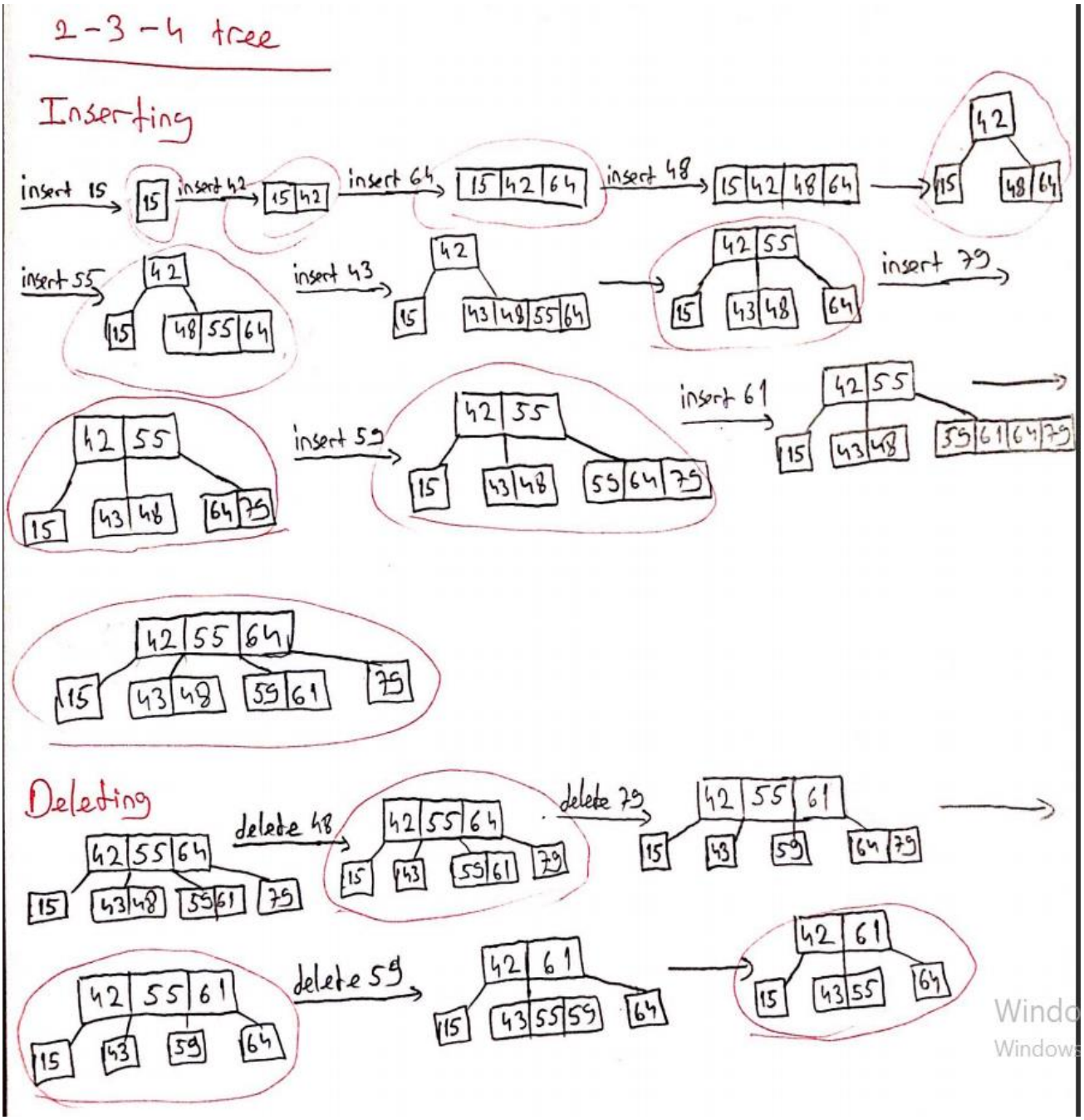
Description: Answers for Q1 and Q2

Question1

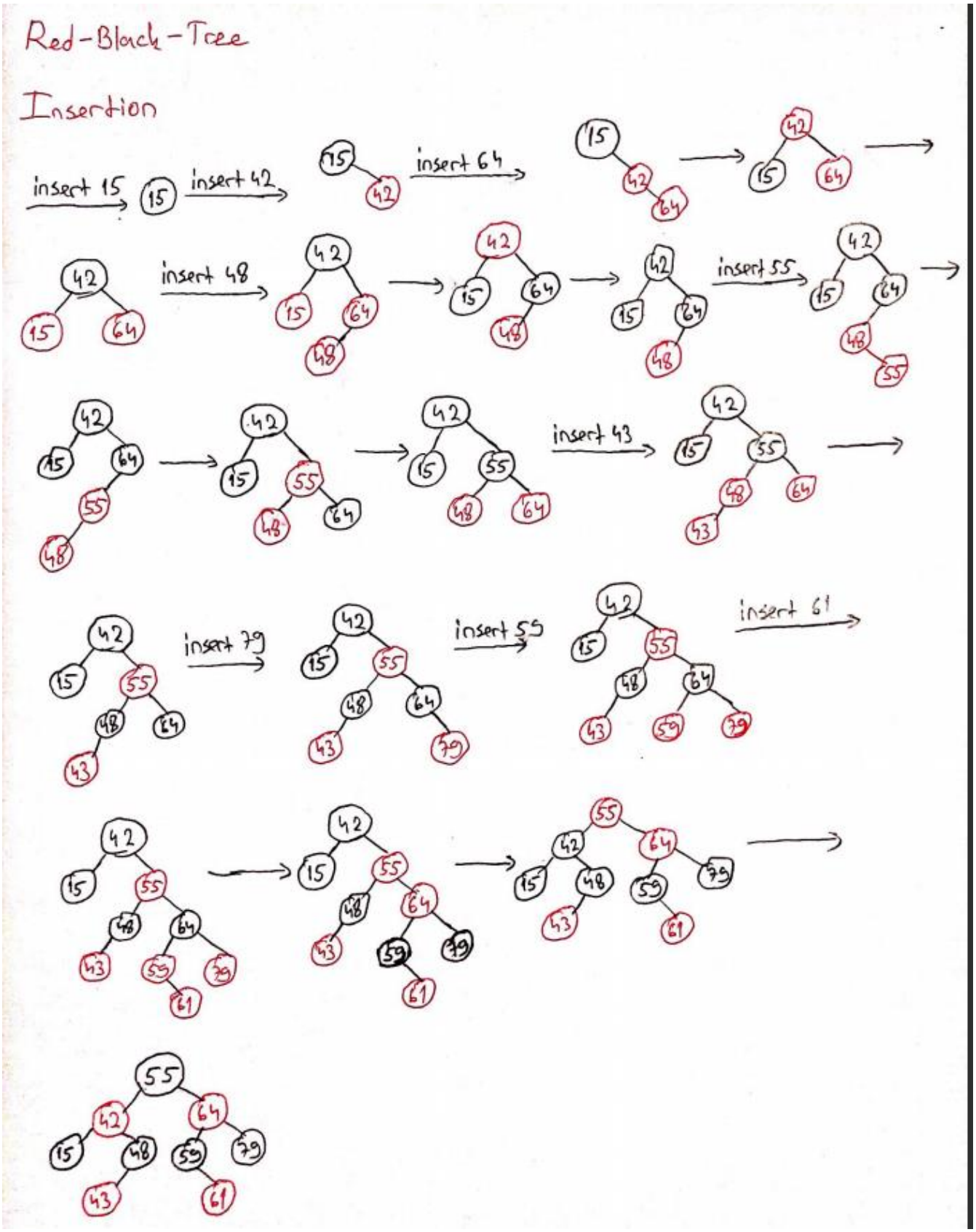
1)



2)

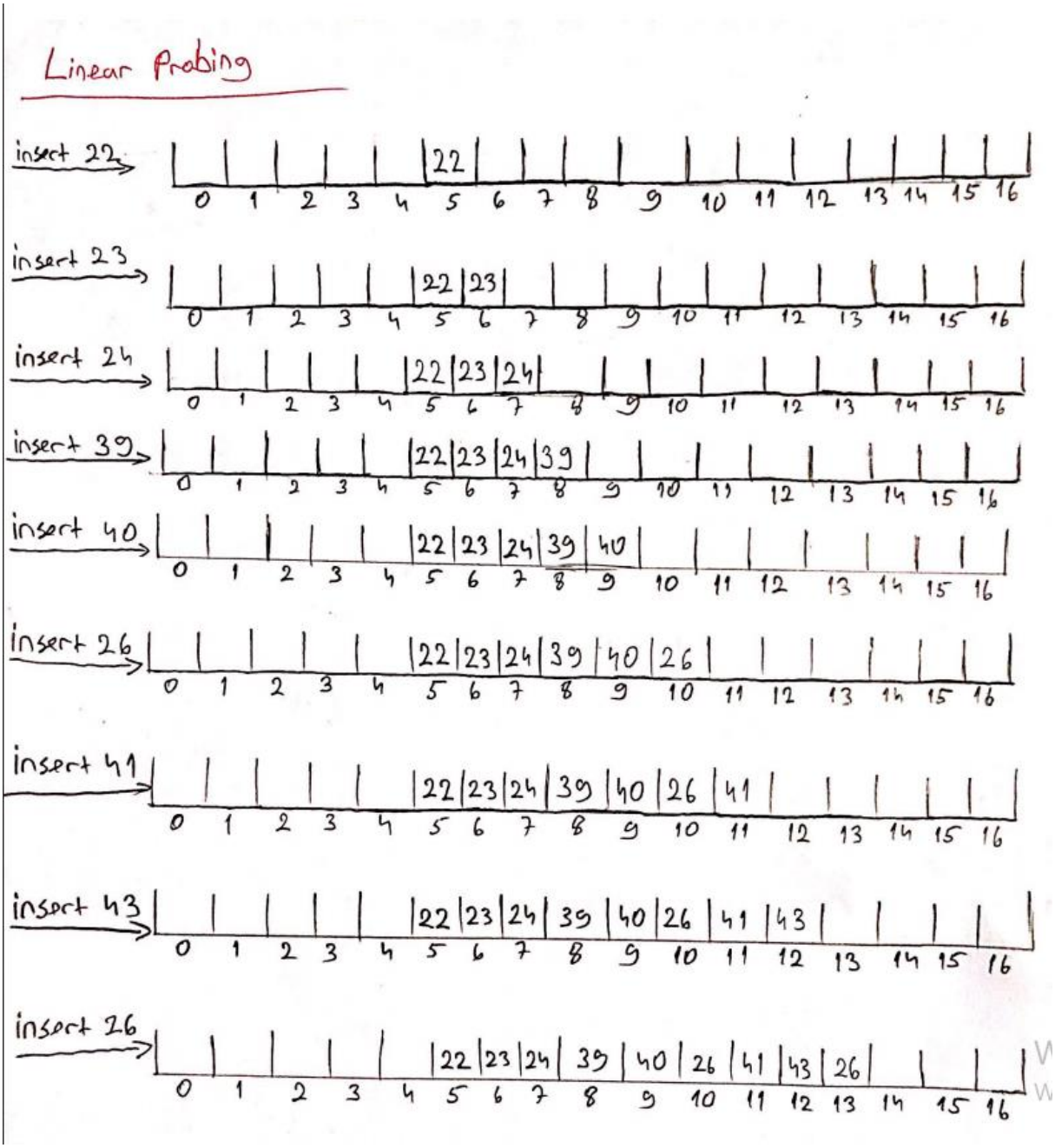

2-3-4 tree
Inserting
insert 15
insert 42
insert 64
insert 48
insert 55
insert 43
insert 79
insert 59
insert 61
Deleting
delete 48
delete 79
delete 59

3)

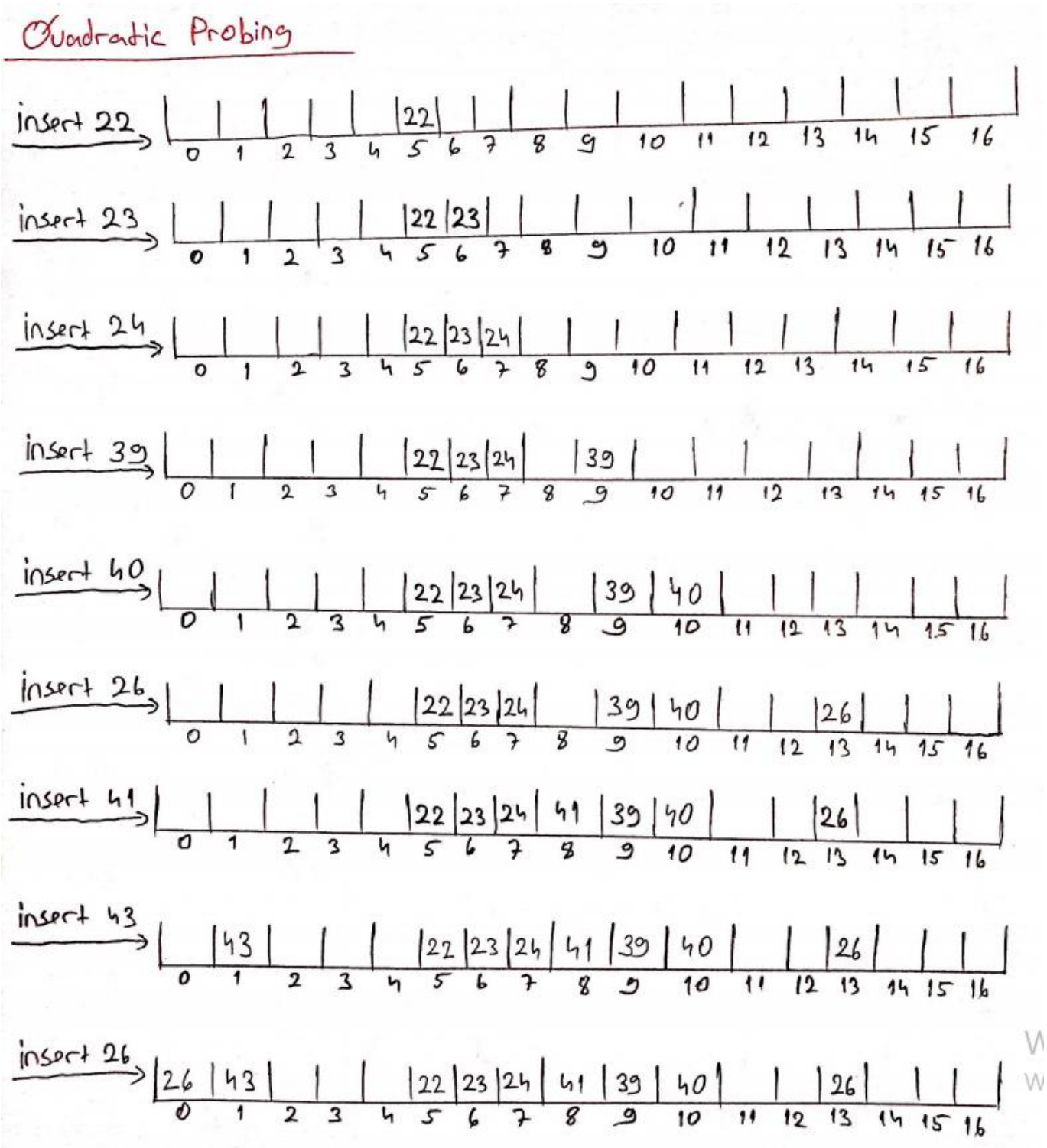

Red-Black-Tree
Insertion
insert 15
insert 42
insert 64
insert 48
insert 55
insert 43
insert 79
insert 55
insert 61

Question2

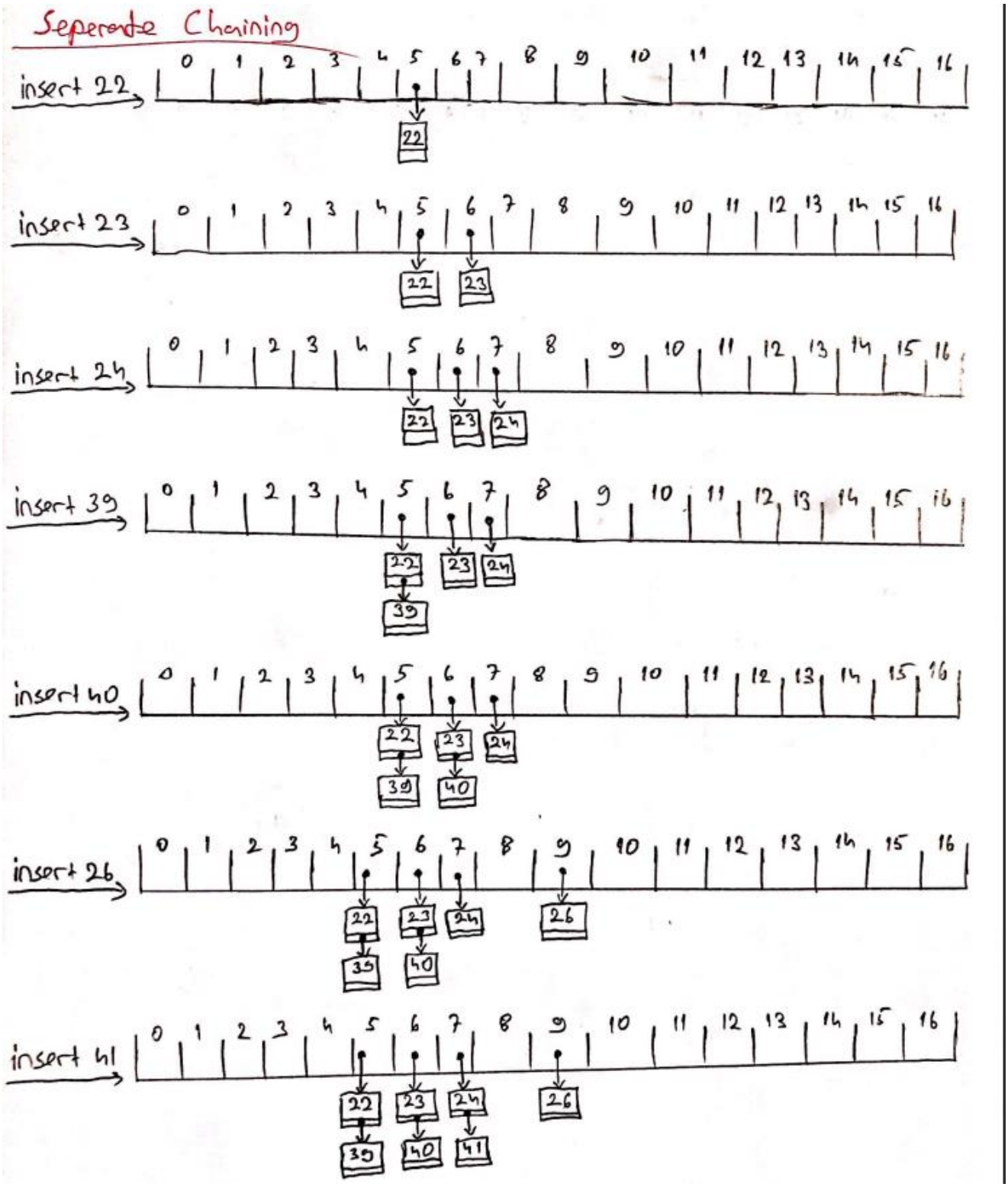
1)

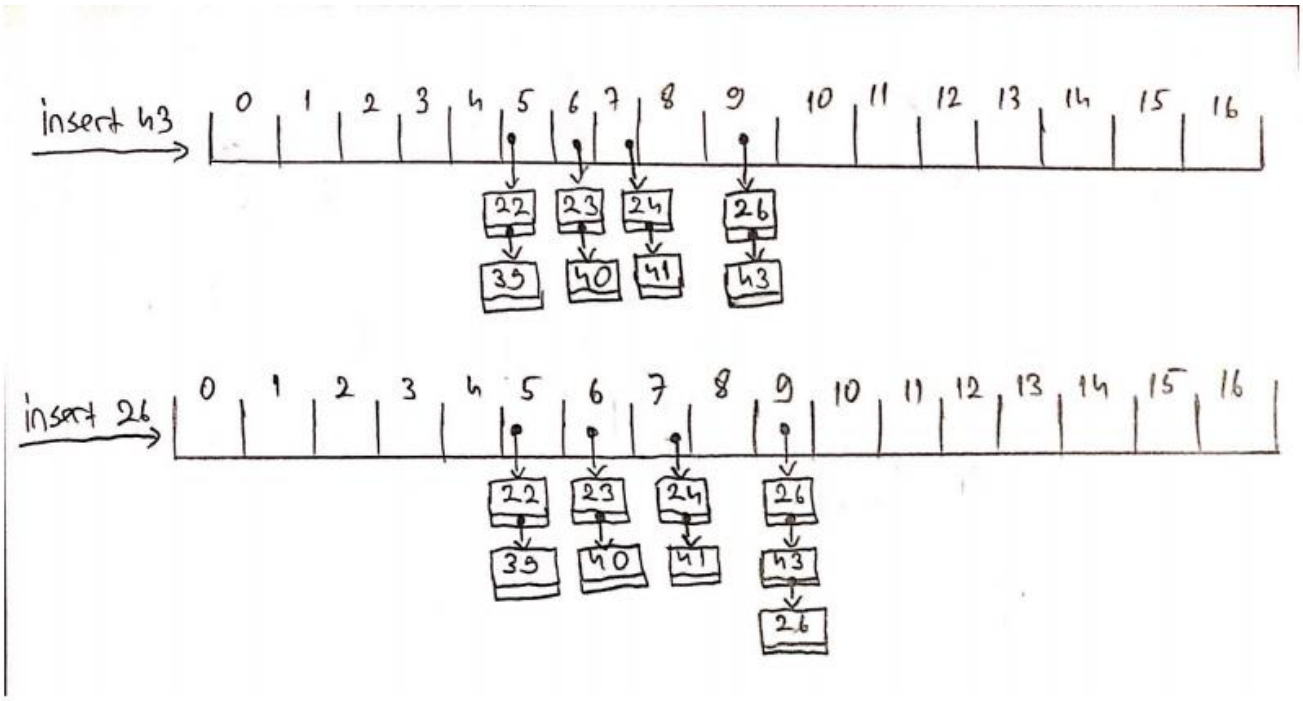

Linear Probing
insert 22
22
insert 23
22 23
insert 24
22 23 24
insert 39
22 23 24 39
insert 40
22 23 24 39 40
insert 26
22 23 24 39 40 26
insert 41
22 23 24 39 40 26 41
insert 43
22 23 24 39 40 26 41 43
insert 26
22 23 24 39 40 26 41 43 26
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

2)


Quadratic Probing
insert 22
insert 23
insert 24
insert 39
insert 40
insert 26
insert 41
insert 43
insert 26
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
22
22 23
22 23 24
22 23 24 39
22 23 24 39 40
22 23 24 39 40 26
22 23 24 41 39 40 26
43 22 23 24 41 39 40 26
26 43 22 23 24 41 39 40 26

3)


Seperate Chaining
insert 22
insert 23
insert 24
insert 39
insert 40
insert 26
insert 41


insert 43
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
22
23
24
26
39
40
41
43

insert 26
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
22
23
24
26
39
40
41
43
26