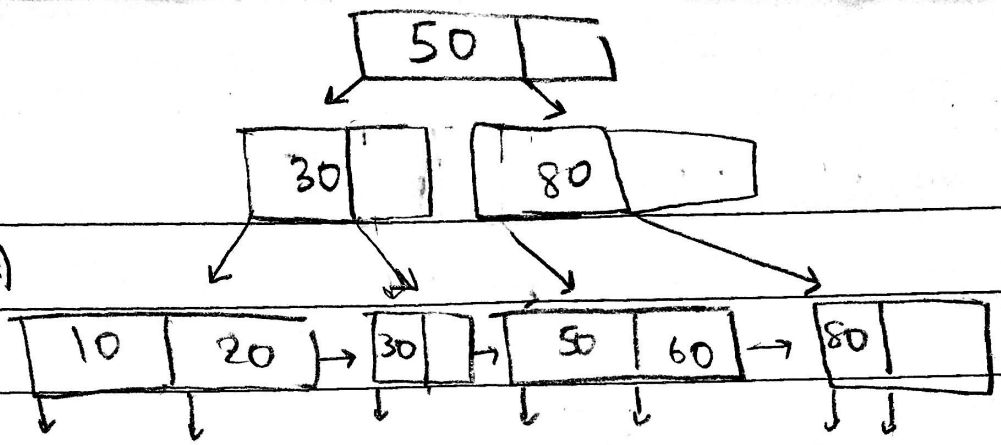
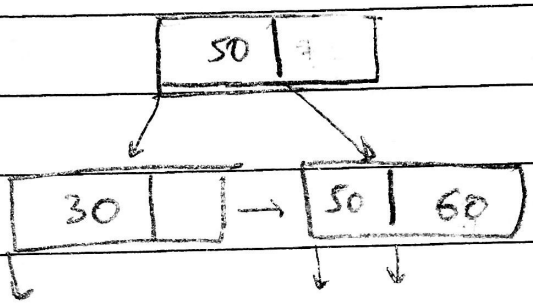
1) a)



b)



For n=5

floor – Maximum Depth:

2) maximum number of nodes at last level: 300/2 = 150

1 – 1

2 – 1×2

3 – 2×3

4 – 6×3

5 – 18×3 = 54

6 – 54×3 = 162

maximum depth is 5.

ceiling – Minimum Depth:

minimum number of nodes at last level = 300/4 = 75

1 – 1

2 – 1×5

3 – 5×5

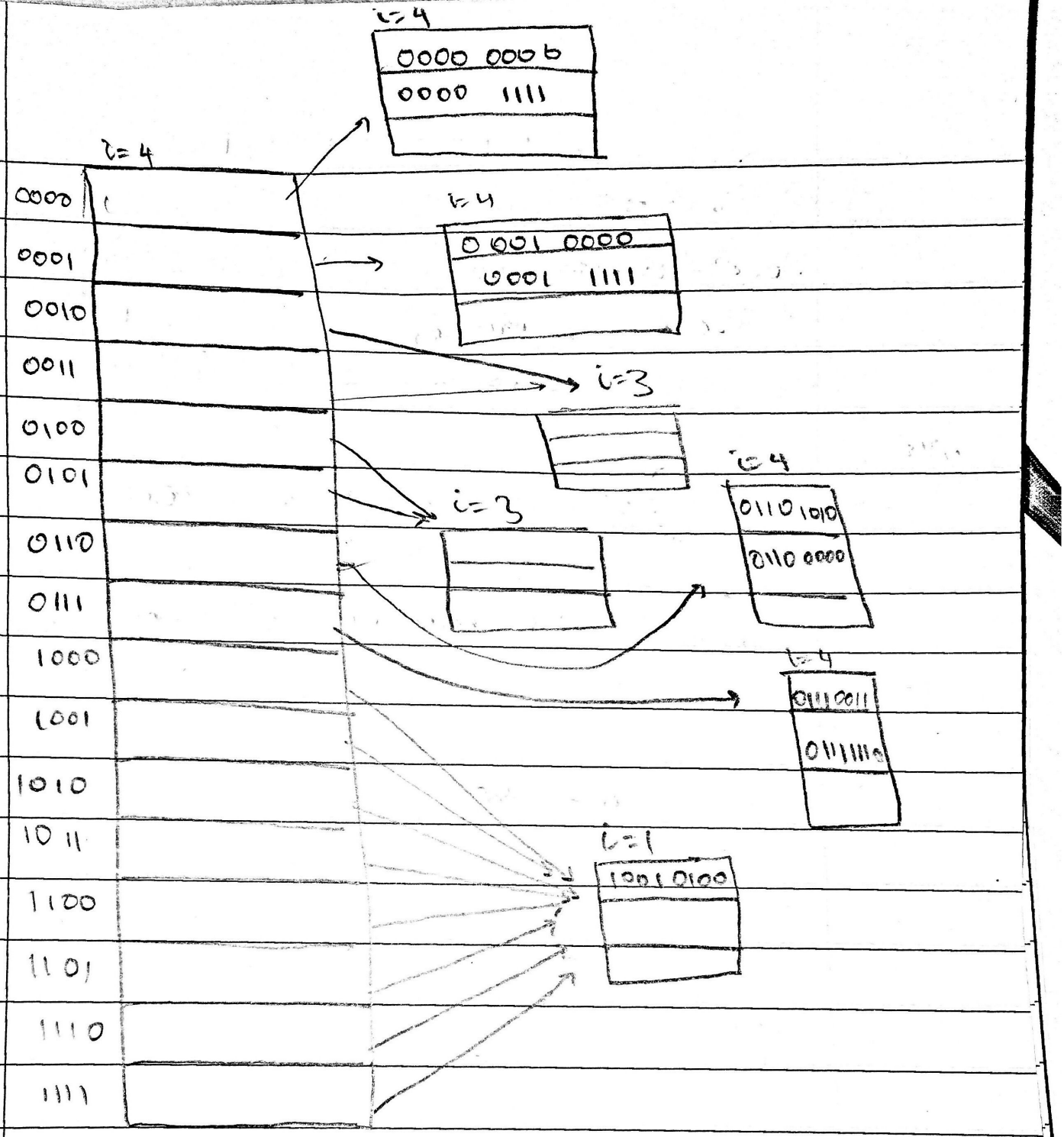
4 – 25×3 = 125

minimum depth is 4

(working backwards: 300/2 150/3 50/3 16/3 5/3≈1

300/4 75/5 15/5 3/5≈1)

3)



~~level 1~~ ~~level 4~~

~~level 2 / level~~

level 3

4 a) Size of R = 20 bytes

No. of tuples in 1 block = 50 Min. No. Blocks = $\frac{5,000}{50} = 100$

Size of S = 190 byts

No. of tuples in 1 block = 5 Min. No. Blocks = $\frac{500}{5} = 100$

R: 100 S: 100

b) Size of one node (n+1 nodes & n pointers and each node has attribute B)

$= 10n + 10(n-1)$

≤ 1000

$n = 50$