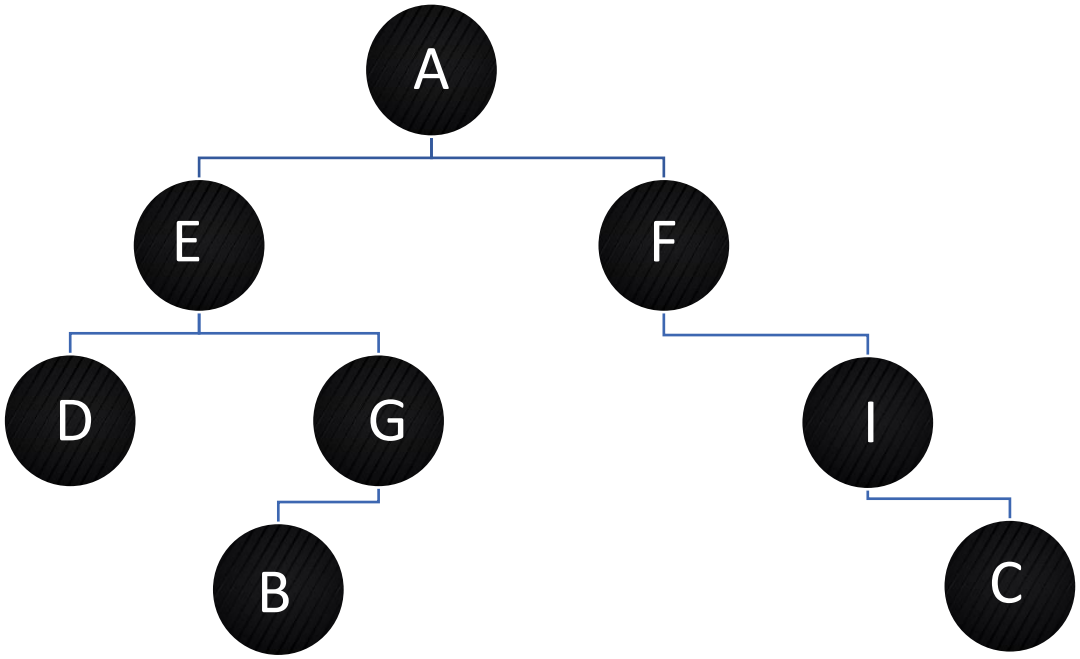
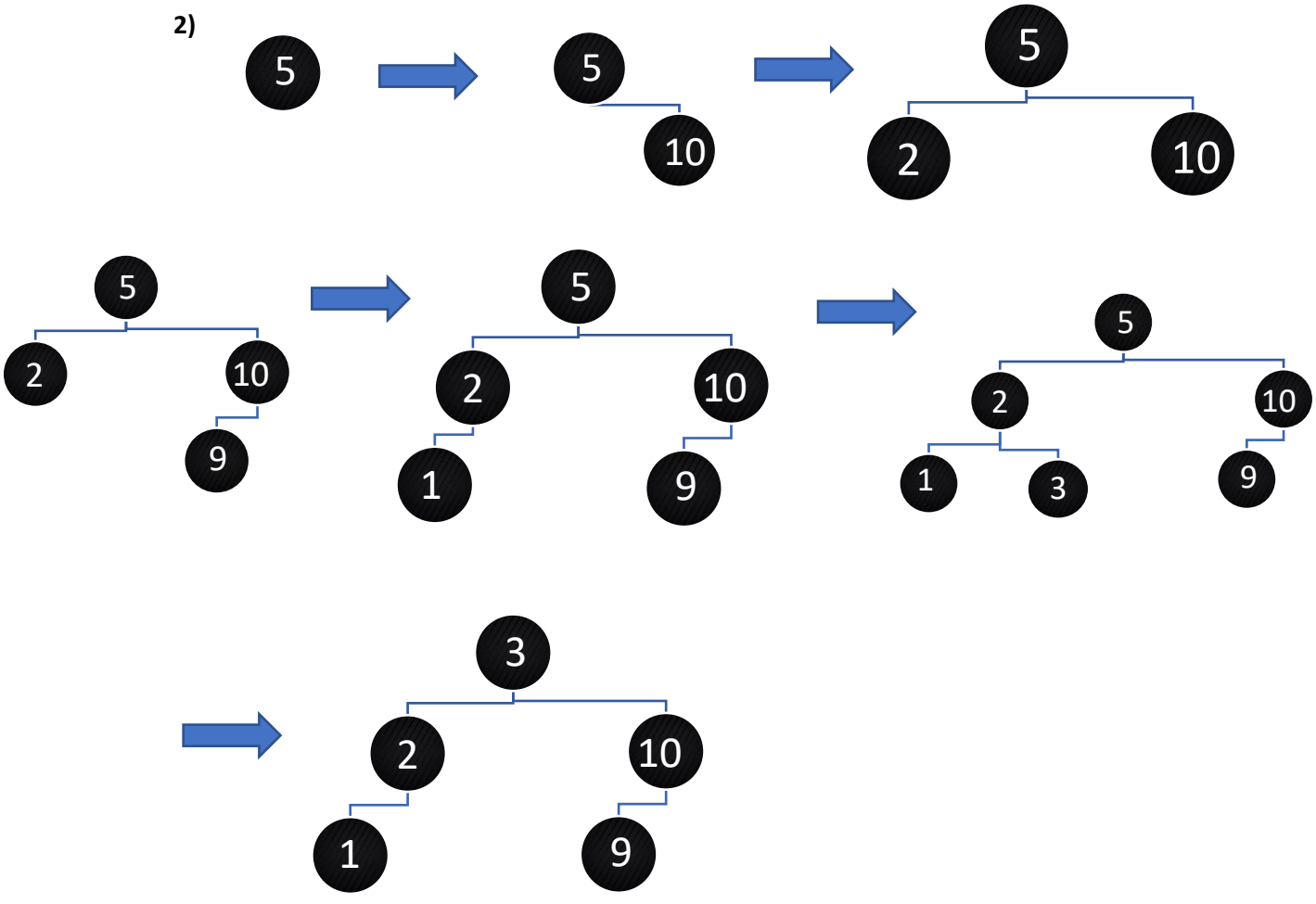
1)

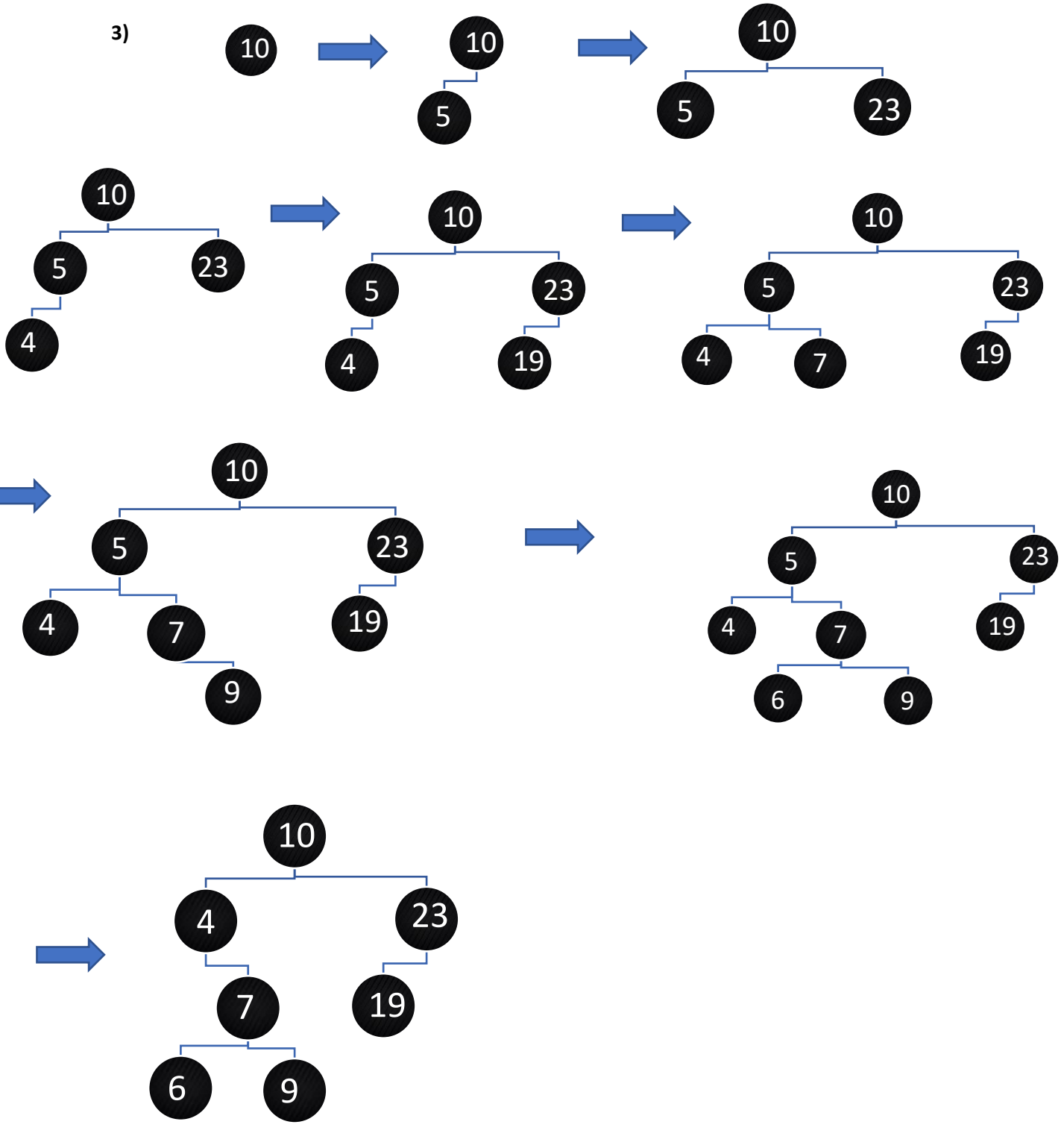


---

2)



3)


10
10
5
10
5
23
10
5
23
4
10
5
23
4
19
10
5
23
4
7
19
10
5
23
4
7
19
9
10
5
23
4
7
19
6
9
10
4
23
7
19
6
9

4)

a. Height equals 4.

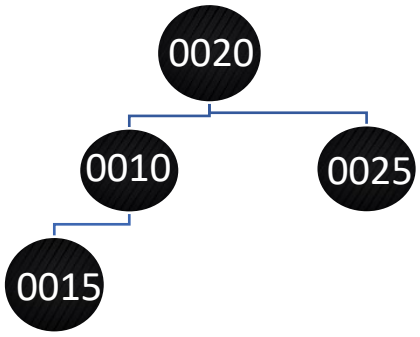
b. The depth of node 90 is 3.

c. The height of node 90 is 1.

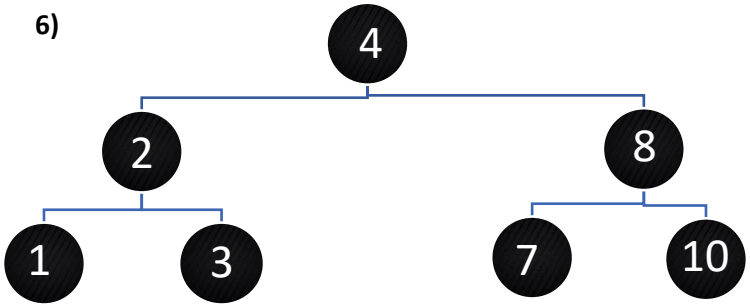
d.

i. Pre-order: 100, 50, 3, 1, 20, 80, 52, 90, 83, 99, 150, 125, 152
ii. In-order: 1, 3, 20, 50, 52, 80, 83, 90, 99, 100, 125, 150, 152
iii. Post-order: 1, 20, 3, 52, 83, 99, 90, 80, 50, 125, 152, 150, 100

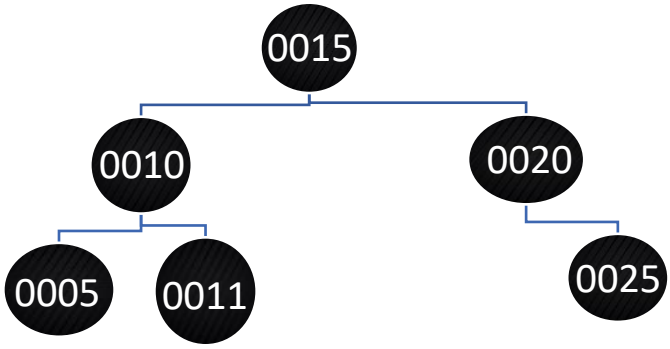
5)



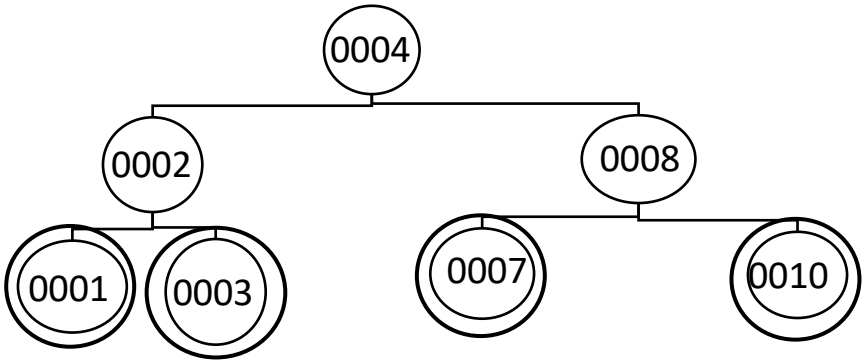
6)



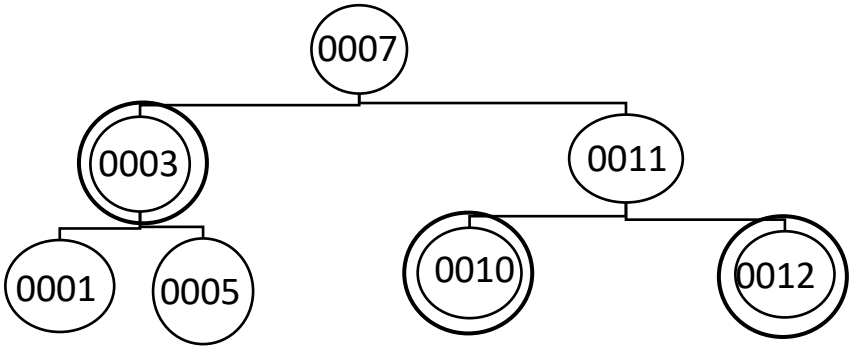
7)



8)

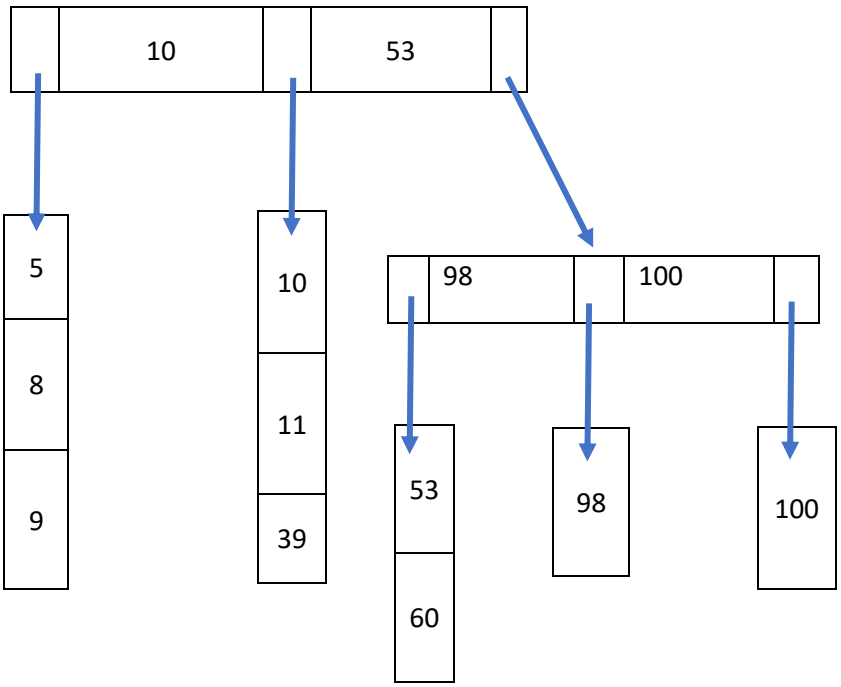

0004
0002
0008
0001
0003
0007
0010

9)

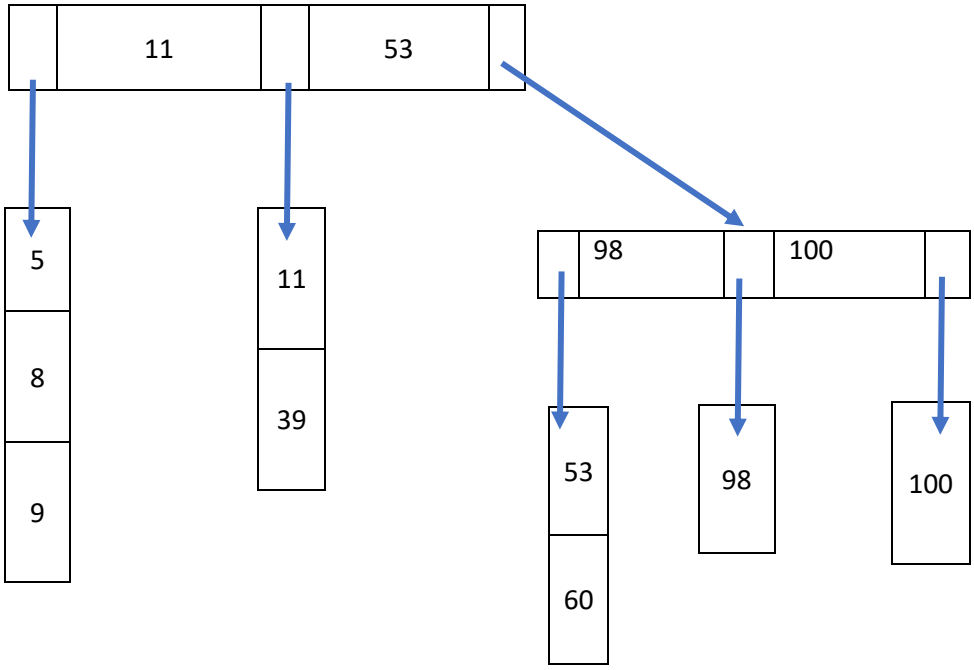

0007
0003
0011
0001
0005
0010
0012

10)

a.


10
53
5
8
9
10
11
39
98
100
53
60
98
100

b.



11)

a. (m × size of pointer) + ((m − 1) × size of key) ≤ size of block
(m x 16) + ((m-1) x 8) ≤ 4096
(16m) + (8m – 8) ≤ 4096
24m ≤ 4104
m ≤ 171.33

m = 171

b. (32 x 2 + (128/8) + 4) x 5 = 420 bytes
420 + 8 = 428 bytes

c. The height is going to be $\log_5(n) - 1 \leq Height(m)$

d. $\log_5(30{,}000) - 1 \leq$ Height
6 ≤ Height

e. $\log_5(2{,}500{,}000) - 1 \leq$ Height
9 ≤ Height