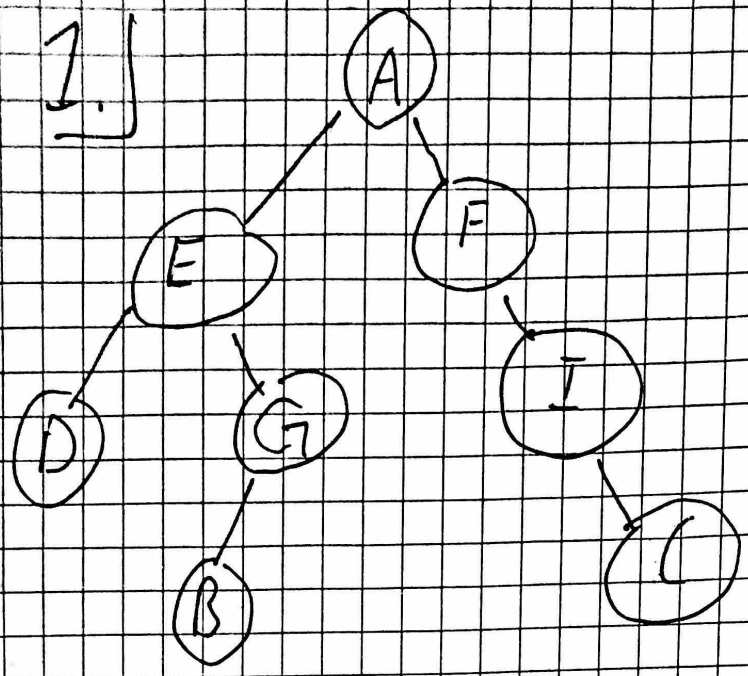
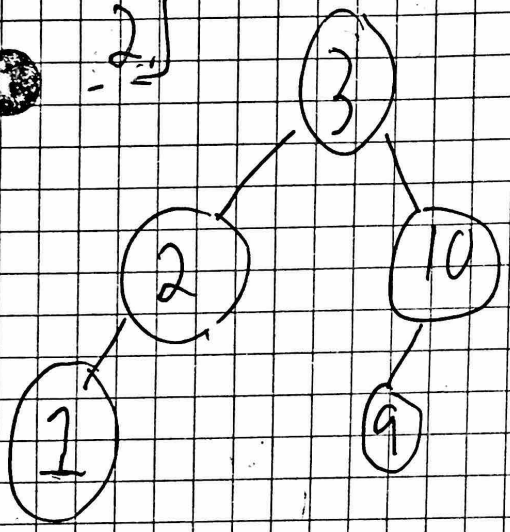
Tyler Richard HW 2

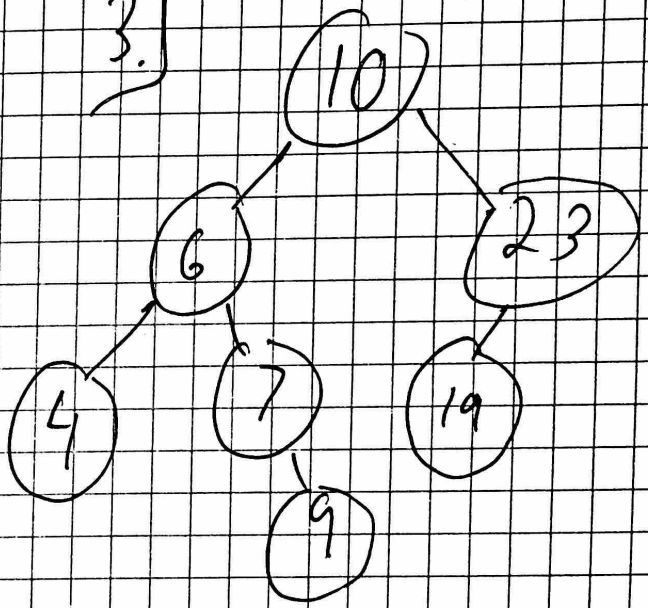
1.)



2.)



3.)



4.] (a) height = 4

(b) Depth of 90 is 3.

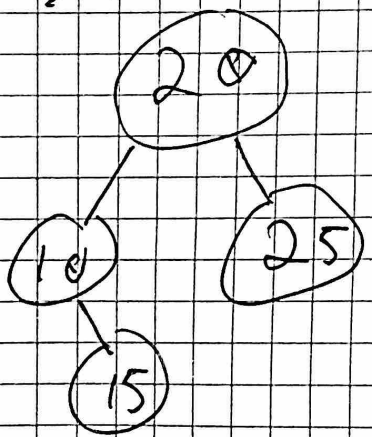
(c) height of 90 is 1

(d) Inorder: 1, 3, 20, 50, 52, 80, 83, 90, 99, 10, 125, 150, 152

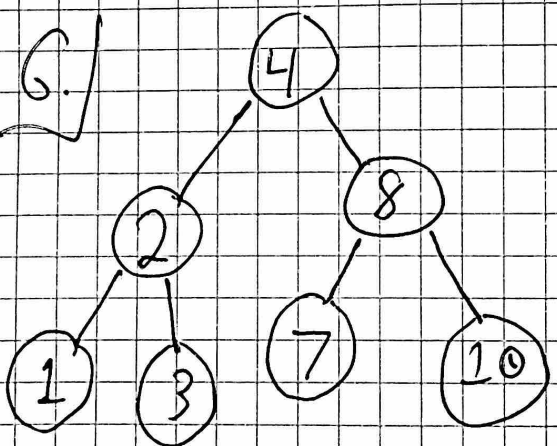
Pre-Order: 20, 50, 3, 1, 20, 80, 52, 90, 83, 99, 150, 125, 152

Post-Order: 1, 20, 3, 52, 83, 99, 90, 80, 50, 125, 152, 150, 20

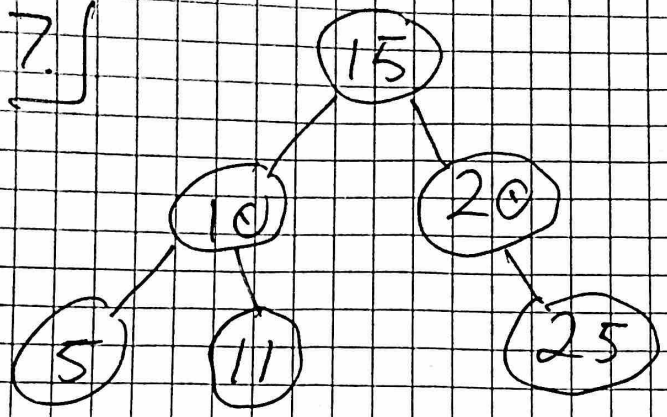
5.]



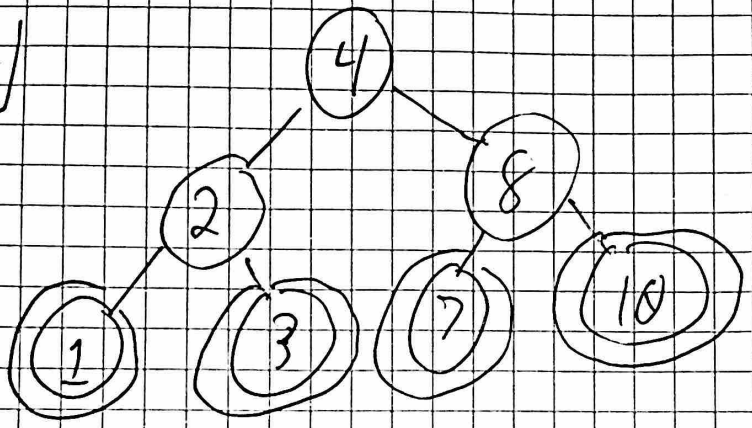
6.]



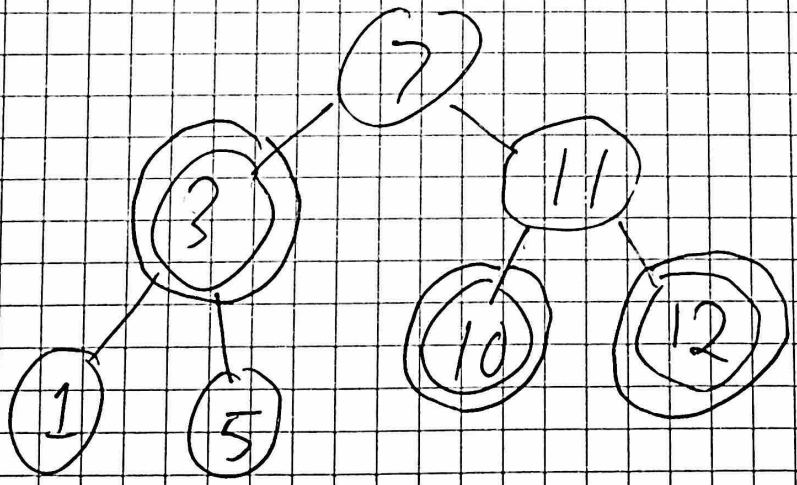
7.



8.

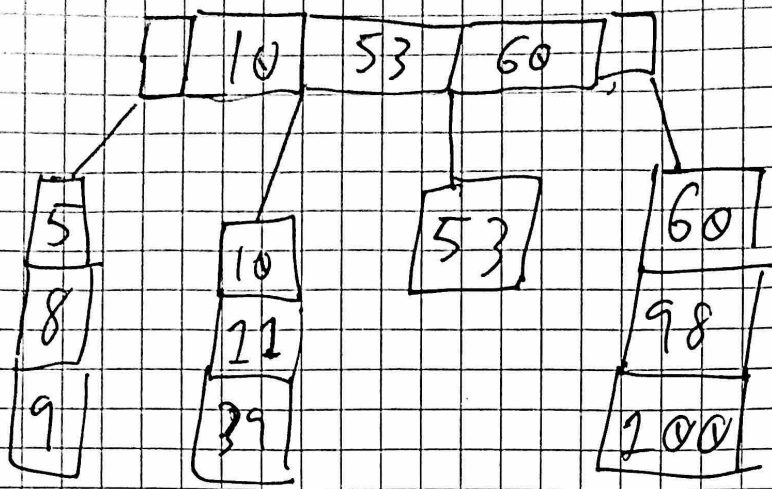


9.

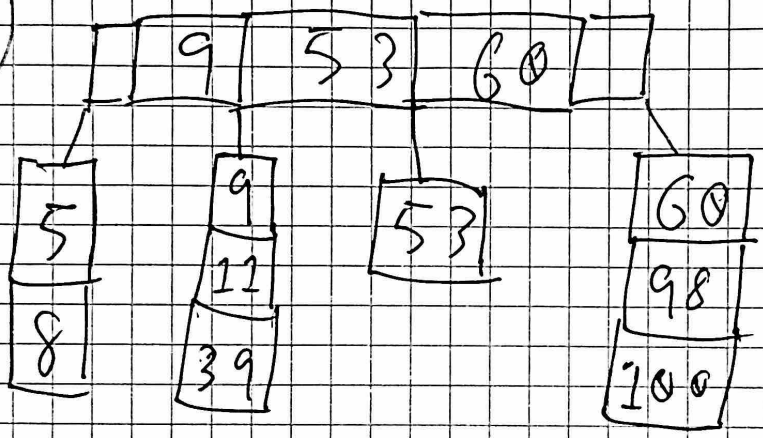


10.

(a)



(b.)



12.) Avg. height in terms of N
w/ N customer records :

Up to 25 sec height = 1

26 - 125 height = 2

126 - 625 height = 3

625 - 3125 height = 4

$\therefore 5^m < N \leq 5^{m+1}$ height = m

Insert 30,000 records :

$\Rightarrow 5^6 < 30{,}000 \leq 5^7$

$\Rightarrow 15625 < 30{,}000 \leq 78125$

$\therefore$ height = 6

Insert 2.5 million customers :

$5^9 < 2{,}500{,}000 \leq 5^{10}$

$\Rightarrow 1953125 < 2{,}500{,}000 \leq 9765625$

$\therefore$ height = 9