Last name	
First name	
Group	

Grade	

1	
2	
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5	

Algorithmics
Undergraduate 1st year S2
Final Exam #2 (P2)
30 May 2018 - 14 : 00
Answer Sheets

Answers 1 **(AVL –** ***3 points*****)**

Final AVL:	*Rotations:*

Answers 2 **(Leonardo trees –** ***3 points*****)**

1. Graphical representation of A_5:

2. (a) $h_n =$ _____

   (b) *Prove that the tree A_n is height-balanced.*

_____

_____

_____

_____

_____

_____

_____

Answers 3 (`List` → `AVL` – ***5 points***)

Specifications:

The function `list2avl(`L`)` returns an A.-V.L. (class `AVL`) built from the list L sorted in stricly increasing order.

***Answers 4* (AVL - Minimum deletion – *6 points*)**

1. Rotations and height changes after minimum deletion:

bal(root)	***bal(right child)***	**rotation**	**Δh**
-2	-1		
	0		
	1		

2. **Specifications:** The function `del_min_avl` (A) deletes the node containing the minimum value of the non-empty AVL A. It returns a pair: the new tree and a boolean = tree height has changed.

***Answers 5* (BST and mystery – *4 points*)**

1. *Returned results?*
   (a) `call(25,` B_1`)` : _____
   (b) `call(21,` B_1`)` : _____
   (c) `call(20,` B_1`)` : _____
   (d) `call(9,` B_1`)` : _____
   (e) `call(53,` B_1`)` : _____

2. `bst_mystery(x, B)` (`B` any BST, with distinct elements).
   At the end of part 1:
   (a) *What does `B` represent?*
   _____
   _____
   (b) *What does `P` represent?*
   _____
   _____
   _____

3. *What does `call(x, B)` do?*
   _____
   _____
   _____
   _____
   _____
   _____