Last name	
First name	
Group	

Grade	

1	
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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.*

_____

_____

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Answers 3 (List $\rightarrow$ 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.
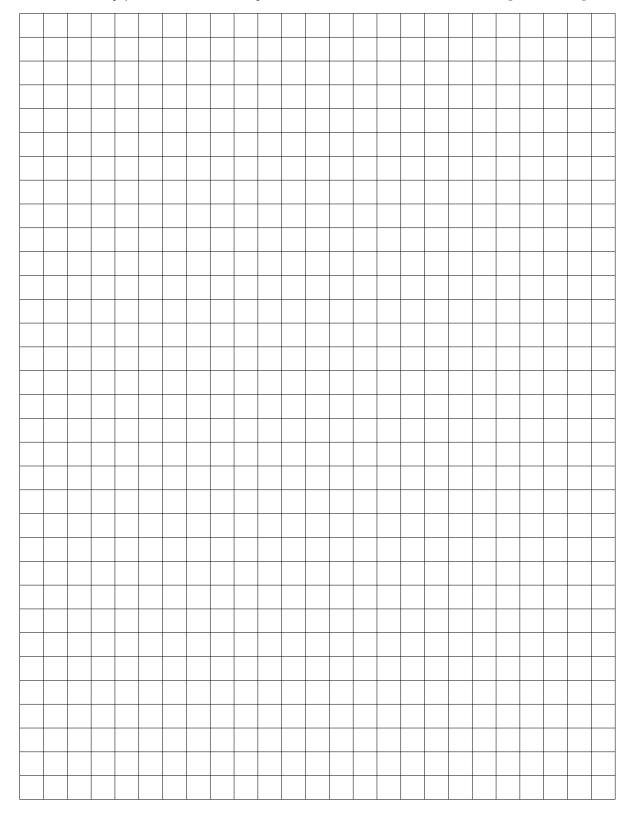
Answers 4 (**AVL - Minimum deletion** − *6 points*)

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?*

   _____

   _____

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