Problem 1 (15 marks). Show the priority queue after inserting the number 10 into the binary heap below:

```
   8
  / \
 12  38
/   / \
29  26 39 51
/   /   /   /   
73 41 50 78 31 56
```

Problem 2 (15 marks). Show the priority queue after performing a delete-min on the binary heap shown in Problem 1.

Problem 3 (5 marks). Give the array representation of the binary heap shown in Problem 1.

Problem 4 (15 marks). Consider the following AVL-tree. Give the sequence of nodes visited when we use the tree to find the predecessor of 69.

```
   40
  /  
 35  70
 /   /  
25 38 48 83
/   /   /   
13 45 63 77
   /           
  50
```

[PLEASE TURN OVERLEAF]
Problem 5 (15 marks). Consider the following AVL-tree again. Give the sequence of nodes visited when we use the tree to find the successor of 69.

Problem 6 (15 marks). Consider the AVL-tree in Problem 5. Give the resulting AVL-tree after inserting 55.

Problem 7 (20 marks). Consider the AVL-tree in Problem 5. Give the resulting AVL-tree after deleting 38.