Ans To The Q. No →1

Overfitting: It's a modeling error
which occurs when a function is too
closely fit to a limited set of data Points.
On
Getting biased to a Particular class label.

In ensemble, boosting is a learning algorithm.
Which can generate high accuracy Predictions
using as a sub-routine another algorithm. It
can generate hypothesis slightly better than
random guessing. By giving weight, & weighted
majority voting ensemble learning boosts up the
the Performance of weak learners.

Answer To The Question No-2

Algorithm 2 AdaBoost Algorithm

Input: Training data, D, number of iterations, k, and a learning scheme.
Output: Ensemble model, M^*
Method:

1: initialise weight, $x_i \in D$ to $\frac{1}{d}$;
2: **for** $i = 1$ to k **do**
3:     sample D with replacement according to instance weight to obtain D_i;
4:     use D_i, and learning scheme to derive a model, M_i;
5:     compute $error(M_i)$;
6:     **if** $error(M_i) \geq 0.5$ **then**
7:       go back to step 3 and try again;
8:     **end if**
9:     **for** each correctly classified $x_i \in D$ **do**
10:       multiply weight of x_i by $(\frac{error(M_i)}{1-error(M_i)})$;
11:     **end for**
12:     normalise weight of instances;
13: **end for**

To use M^* to classify a new instance, x_{New}:

1: initialise weight of each class to zero;
2: **for** $i = 1$ to n **do**
3:     $w_i = log\frac{1-error(M_i)}{error(M_i)}$; // weight of the classifier's vote
4:     $c = M_i(x_{New})$; // class prediction by M_i
5:     add w_i to weight for class c;
6: **end for**
7: return class with largest weight;