

a)

Decision tree train accuracy : 1.00

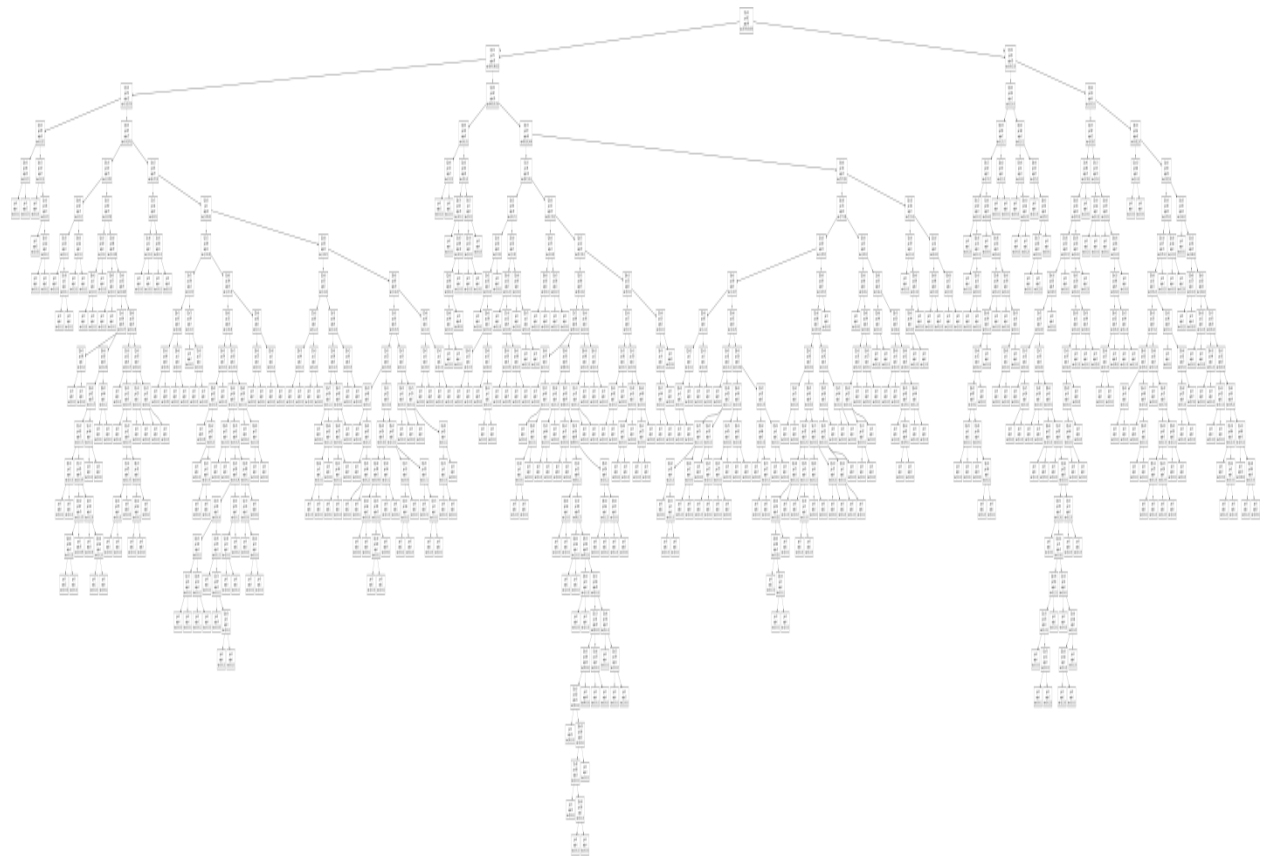
Decision tree test accuracy : 0.84

confusion matrix for decision tree :

```
[[431  1  6  1 16  1]
 [ 3 188  1  4  5  5]
 [ 5  0 354 33  2 13]
 [ 4  0 29 95  2 63]
 [ 8  7  1  5 173 20]
 [ 0  0  7 44 17 387]]
```

Yes, the difference in training and test accuracy is large (0.16), it seems like the decision tree is overfitting.

Decision tree is as shown below:-



b)

Random forest mean accuracy : 0.90

Random forest std : 0.01

Naive bayes mean accuracy : 0.80

Naive bayes std : 0.02

(array(14.403694424751937), 2.5362485162226222e-11)

In the significance test, p-value, is very very small (<0.025), so we will reject the null hypothesis, and hence Random Forest is better than Naive Bayes.