

# CSE 471 (Machine Learning) Class Test 1

Student No (DON'T FORGET TO FILL):

Time: 30 minutes

Circle clearly the correct choice with pen (no pencil). Any ambiguity will be considered as wrong answer.

1. A B C D E
2. A B C D E
3. A B C D E
4. A B C D E
5. A B C D E

**DO NOT WRITE ANYTHING AFTER THE FOLLOWING DOTTED LINE**

---

1) In Random forest you can generate hundreds of trees (say  $T_1, T_2, \dots, T_n$ ) and then aggregate the results of these trees. Which of the following is true about an individual ( $T_k$ ) tree in Random Forest?

1. Individual tree is built on a subset of the features
2. Individual tree is built on all the features
3. Individual tree is built on a subset of observations
4. Individual tree is built on full set of observations

- A. 1 and 3**
- B. 1 and 4
- C. 2 and 3
- D. 2 and 4
- E. None of these

2) Which of the following is/are true about boosting trees?

1. Individual weak learners are independent of each other
2. It is the method for improving the performance by aggregating the results of weak learners
3. Randomly generated bootstrap samples are used to train weak learner at each stage

- A. 1 and 2
- B. 2 and 3
- C. 1 and 3
- D. 1, 2 and 3
- E. None of these**

3) Which of the following is/are true about bagging trees?

1. Individual weak learners are independent of each other
2. It is the method for improving the performance by aggregating the results of weak learners
3. Randomly generated bootstrap samples are used to train weak learner at each stage

- A. 1 and 2
- B. 2 and 3
- C. 1 and 3
- D. 1, 2 and 3**
- E. None of these

4) Which of the following cannot be true about principal component analysis (PCA)?

1. PCA can be used with labeled data
2. Explicit testing for unit length of principal component is unnecessary if we use Lagrange's multiplier during optimization
3. The largest eigenvalue of the co-variance matrix represents the maximum variance of projection along first principal component

- A. 1 and 2
- B. 2 and 3
- C. 1 and 3
- D. 1, 2 and 3
- E. None of these**

5) PCA maximizes variance of projections of sample vectors along

- A. orthogonal principal components
- B. axes of low-dimensional space
- C. eigenvectors of covariance matrix
- D. All of the above**
- E. None of the above