Started on	Wednesday, 29 October 2025, 12:30 PM
State	Finished
Completed on	Wednesday, 29 October 2025, 12:37 PM
Time taken	7 mins 33 secs
Marks	14.00/15.00
Grade	**93.33** out of 100.00

Question 1

Complete

Mark 1.00 out of 1.00

In AdaBoost, how is the weight of a weak learner determined?

- a. Using the formula $\alpha = (1/2)\ln((1-\varepsilon)/\varepsilon)$
- b. Randomly initialized each time
- c. By accuracy alone
- d. Using gradient descent

Question 2

Complete

Mark 1.00 out of 1.00

The function $F(x) = F_{prev}(x) + \eta \cdot h(x)$ indicates:

- a. A residual correction step in Gradient Boosting
- b. Bagging model averaging
- c. Updating weights in AdaBoost
- d. Cross-validation step

Question 3

Complete

Mark 1.00 out of 1.00

What does the learning rate η control in Gradient Boosting?

- a. The contribution of each weak learner
- b. The number of residuals generated
- c. Tree depth
- d. The number of features used

Question 4

Complete

Mark 1.00 out of 1.00

What does the term "adaptive" in AdaBoost refer to?

- a. Adjusting model depth at each iteration
- b. Updating the weights of samples based on errors
- c. Changing learning rate automatically
- d. Modifying the kernel function dynamically

Question 5

Complete

Mark 1.00 out of 1.00

What happens to the sample weights after an AdaBoost iteration?

- a. All weights are halved
- b. Weights of correctly classified samples increase
- c. Weights of misclassified samples increase
- d. Weights remain unchanged

Question 6

Complete

Mark 1.00 out of 1.00

What is a key reason Gradient Boosting may overfit?

- a. Too few trees
- b. Using regularization
- c. Too many deep trees
- d. Too small learning rate

Question 7

Complete

Mark 1.00 out of 1.00

What is a residual in Gradient Boosting?

- a. A random noise term
- b. The number of iterations completed
- c. The gradient of the feature vector
- d. The difference between actual and predicted values

Question 8

Complete

Mark 0.00 out of 1.00

What is the loss function minimized by AdaBoost?

- a. Cross-entropy loss
- b. Mean squared error
- c. Hinge loss
- d. Exponential loss

Question 9

Complete

Mark 1.00 out of 1.00

What is the main goal of AdaBoost?

- a. To combine multiple strong classifiers into a weak one
- b. To minimize the mean squared error
- c. To combine multiple weak classifiers into a strong one
- d. To increase data dimensionality

Question 10

Complete

Mark 1.00 out of 1.00

What type of optimization is Gradient Boosting performing?

- a. Random search
- b. Genetic optimization
- c. Grid search
- d. Gradient descent in function space

Question 11

Complete

Mark 1.00 out of 1.00

Which modern algorithms are derived from the principle of Gradient Boosting?

- a. PCA and t-SNE
- b. Random Forest and Bagging
- c. Logistic Regression and SVM
- d. XGBoost, LightGBM, CatBoost

Question 12

Complete

Mark 1.00 out of 1.00

Which of the following is NOT an advantage of AdaBoost?

- a. Simplicity of implementation
- b. Works well with weak learners
- c. Handles noise robustly
- d. Often achieves high accuracy

Question 13

Complete

Mark 1.00 out of 1.00

Which of the following is TRUE about AdaBoost vs. Gradient Boosting?

- a. AdaBoost uses weighted data; Gradient Boosting uses residuals
- b. AdaBoost can use any differentiable loss
- c. Both minimize exponential loss
- d. Gradient Boosting works only for classification

Question 14

Complete

Mark 1.00 out of 1.00

Which of the following is usually used as a weak learner in AdaBoost?

- a. Decision stump
- b. Logistic regression
- c. Neural network
- d. K-nearest neighbors

Question 15

Complete

Mark 1.00 out of 1.00

Which statement best describes Gradient Boosting?

- a. It combines models that predict misclassified labels
- b. It averages independent models to reduce variance
- c. It reduces dimensionality before modeling
- d. It sequentially adds models that correct residual errors