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Grade	10.00 out of 10.00 (100%)

Question 1

Correct

Mark 1.00 out of 1.00

What are some advantages of Naive Bayes over other learning methods, as highlighted in its performance in various applications?

- a. Superior performance in handling changing class definitions over time compared to other classifiers
- b. Effective handling of irrelevant features
- c. Naive Bayes is the optimal classifier in domains with many equally important features, ensuring accurate predictions
- d. Fast learning and testing due to simple computation, along with low storage requirements ✓

The correct answers are: Effective handling of irrelevant features, Fast learning and testing due to simple computation, along with low storage requirements

Question 2

Correct

Mark 1.00 out of 1.00

When an algorithm exclusively derives entailed sentences, it is termed as:

- a. Ambiguous
- b. Truth-preserving or sound ✓
- c. Arbitrary
- d. Inconsistent

The correct answer is: Truth-preserving or sound

Question 3

Correct

Mark 1.00 out of 1.00

What is logically equivalent to the following statement - "If you fail then I fail"

(note that fail is equivalent to not pass)

A)

B)

C)

D)

Correct answer: C) I pass only if you pass

- a. You pass only if I pass
- b. You fail if I pass
- c. If you fail then I not fail
- d. I pass only if you pass ✓

The correct answer is: I pass only if you pass

Question 4

Correct

Mark 1.00 out of 1.00

What is the primary objective of introducing regularization in machine learning models?

- a. To prevent overfitting and improve generalization by introducing additional information ✓
- b. To minimize the impact of noise in the training dataset
- c. To simplify the model representation and reduce computational complexity
- d. To increase model complexity for better fit to training data

The correct answer is: To prevent overfitting and improve generalization by introducing additional information

Question 5

Correct

Mark 1.00 out of 1.00

In first-order logic, what is the purpose of quantifiers?

a. Determine validity

b. Manage variable scope ✓

c. Define relationships

d. Specify truth values

The correct answer is: Manage variable scope

Question 6

Correct

Mark 1.00 out of 1.00

In a population, a certain medical test for a rare disease is known to have a sensitivity of 98% (true positive rate) and a specificity of 95% (true negative rate). If the prevalence of this disease in the population is 0.1%, and a randomly selected person tests positive for it, what is the probability that they have it?

a. 98%

b. 50%

c. Less than 1% ✓

d. 20%

The correct answer is: Less than 1%

Question 7

Correct

Mark 1.00 out of 1.00

What does cross-validation aim to achieve in machine learning?

a. Testing the model on a separate dataset to evaluate performance

b. Assessing the generalization ability of the model ✓

c. Dividing the dataset into training and testing sets

d. Tuning hyperparameters to optimize model performance

The correct answer is: Assessing the generalization ability of the model

Question 8

Correct

Mark 1.00 out of 1.00

What assumption does Naive Bayes make about the relationship between features in a dataset?

- a. Correlation
- b. Linearity
- c. Independence ✓
- d. Exclusivity

The correct answer is: Independence

Question 9

Correct

Mark 1.00 out of 1.00

Which type of Naive Bayes classifier is most suitable for SPAM/NOT-SPAM text classification tasks?

- a. Multinomial ✓
- b. Binomial
- c. Bernoulli
- d. Gaussian

The correct answer is: Multinomial

Question 10

Correct

Mark 1.00 out of 1.00

Which formula represents the fundamental principle used in Naive Bayes classification to calculate the posterior probability of a class, given predictor variables?

- a. P(class | predictors) = P(predictors | class) * P(class)
- b. P(predictors) = P(predictors | class) * P(class | predictors) * P(class)
- c. P(class) = (P(predictors | class) / P(predictors)) * P(class | predictors)
- d. P(class | predictors) = (P(predictors | class) * P(class)) / P(predictors) ✓

The correct answer is: P(class | predictors) = (P(predictors | class) * P(class)) / P(predictors)