

Guideline Quizzes for Module 14

Question 1

1 point

What is the primary use of nonnested model selection tests?

Choose at least one correct answer

- ☐ (A) Compare nested models
- ☒ (B) Compare models that are not nested within each other
- ☐ (C) Improve p-values
- ☐ (D) Optimize the sample size

Correct answer

Question 2

1 point

Which method is recommended for testing nonnested models?

Choose at least one correct answer

- ☒ (A) Distribution-free tests
- ☐ (B) Likelihood ratio tests
- ☐ (C) t-tests
- ☐ (D) Z-tests

Correct answer

Question 3

1 point

What is a key advantage of using a distribution-free test for nonnested model selection?

Choose at least one correct answer

- ☒ (A) It does not rely on assumptions about the distribution of errors
- ☐ (B) It increases the precision of estimates

Correct answer

☐ C It eliminates the need for model fitting

☐ D It simplifies hypothesis testing

Question 4

1 point

What is the Akaike Information Criterion (AIC) used for in model selection?

Choose at least one correct answer

☐ A Hypothesis testing

☒ B **Selecting models based on goodness of fit and penalizing complexity**

Correct answer

☐ C Adjusting p-values

☐ D Calculating residuals

Question 5

1 point

Which of the following is NOT a criterion commonly used for model selection?

Choose at least one correct answer

☐ A AIC (Akaike Information Criterion)

☐ B BIC (Bayesian Information Criterion)

☒ C t-statistic

Correct answer

☐ D Cross-validation

Question 6

1 point

What does the BIC penalize more heavily than the AIC?

Choose at least one correct answer

☐ A Overfitting

☒ B **Model complexity, especially with larger datasets**

Correct answer

☐ (C) Sample size

☐ (D) Outliers

Question 7

1 point

Which is a limitation of model selection based solely on hypothesis testing?

Choose at least one correct answer

☐ (A) It guarantees a unique solution

☒ (B) It can lead to overfitting and exaggerated precision

Correct answer

☐ (C) It simplifies complex models too much

☐ (D) It disregards p-values

Question 8

1 point

Why might models be penalized for adding more parameters in BIC and AIC?

Choose at least one correct answer

☐ (A) To avoid underfitting

☐ (B) To increase confidence intervals

☒ (C) To reduce overfitting and promote parsimony

Correct answer

☐ (D) To lower standard errors

Question 9

1 point

In diagnostics, why is multicollinearity a concern in regression models?

Choose at least one correct answer

☒ (A) It causes unstable estimates for regression coefficients

Correct answer

☐ (B) It increases standard errors

☐ C It reduces residual variance

☐ D It leads to biased estimates

Question 10

1 point

What is a common problem with using large sample sizes in model selection tests?

Choose at least one correct answer

☐ A It increases Type II errors

☒ B Even small effects may become statistically significant, leading to overfitting

Correct answer

☐ C It decreases the power of the test

☐ D It distorts the regression coefficients