

Started on	Wednesday, 15 April 2020, 9:29 AM
State	Finished
Completed on	Wednesday, 15 April 2020, 9:52 AM
Time taken	22 mins 58 secs
Grade	8 out of 10 (80%)

Question 1

Correct

Mark 1 out of 1

We can only find a maximum likelihood estimator if regularity conditions R0 through R2 are satisfied.

Select one:

- ☐ True
- ☒ False ✓

Correct.

The correct answer is 'False'.

Question 2

Incorrect

Mark 0 out of 1

What are the estimating equations that we use to find the MLE called?

Answer:

likelihood equations/estimating equations

✖

They are called "score equations."

The correct answer is: The score equation

Question 3

Correct

Mark 1 out of 1

Check each property of a MLE.

Select one or more:

- ☐ a. They are unbiased
- ☒ b. They are consistent when the MLE is unique. ✓ Correct
- ☐ c. Their variance is always the smallest of all estimators.
- ☐ d. They are always efficient even in small samples.
- ☒ e. The invariance property says that the MLE of the function of a parameter is the function evaluated at the MLE of the parameter ✓ Correct.

Your answer is correct.

The correct answers are: They are consistent when the MLE is unique., The invariance property says that the MLE of the function of a parameter is the function evaluated at the MLE of the parameter

Question **4**  
Correct  
Mark 1 out of 1

The Cramer-Rao Lower Bound gives us a lower bound on the variance of any estimator.

Select one:

- ☒ True ✖
- ☐ False

The estimator must be unbiased.

The correct answer is 'False'.

Comment:

Your answer is fine.

Question **5**  
Correct  
Mark 1 out of 1

Which kind of test is the most conservative (i.e., protects you the most from making a Type I error)?

Select one:

- ☐ a. Likelihood ratio test
- ☐ b. Wald test
- ☒ c. Score test ✔ Correct.

Your answer is correct.

The correct answer is: Score test

Comment:

Question **6**  
Incorrect  
Mark 0 out of 1

The distribution of  $-2\ln(\lambda)$  is a chi-square with degrees of freedom equal to the number of parameters fixed under the null hypothesis.

Select one:

- ☒ True ✖
- ☐ False

This is only true in large samples.

The correct answer is 'False'.

Question **7**  
Correct  
Mark 1 out of 1

In order for a sample of size  $n$  to contain  $n$  times the amount of information as a single observation, what needs to be true about the observations, they need to be...?

Answer: independent & identically distributed random variables ✖

They must be i.i.d.

The correct answer is: i.i.d.

Comment:

Question **8**  
Correct  
Mark 1 out of 1

Confidence intervals using MLEs can be made using the normal distribution if the sample size is large.

Select one:

- ☒ True ✓  
☐ False

Correct.

The correct answer is 'True'.

Question **9**  
Correct  
Mark 1 out of 1

Likelihood ratio tests evaluate what distance?

Select one:

- ☒ a. The distance between the joint probability at the null value and the joint probability at the MLE. ✓ Correct.  
☐ b. The slope of the tangent line at the MLE to the curvature of the likelihood at the MLE.  
☐ c. The distance between the null value of the parameter and the MLE.

Your answer is correct.

The correct answer is: The distance between the joint probability at the null value and the joint probability at the MLE.

Question **10**  
Correct  
Mark 1 out of 1

We can maximize the natural log of the likelihood function rather than the likelihood function itself since it is monotone increasing.

Select one:

- ☒ True ✓  
☐ False

Correct.

The correct answer is 'True'.

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[Multiparameter MLEs ▶](#)