

**The Infinite Actuary Exam STAM Online Course**  
**C.4.7. Practice Problems on Score Based Model Choices**

1. [C.F06.22] Five models are fitted to a sample of  $n = 260$  observations with the following results:

Model	Number of Parameters	Loglikelihood
I	1	-414
II	2	-412
III	3	-411
IV	4	-409
V	6	-409

Determine the model favored by the Schwarz Bayesian criterion.

- A. I                      B. II                      C. III                      D. IV                      E. V

2. Variant on [C.F06.22] Five models are fitted to a sample of  $n = 260$  observations with the following results:

Model	Number of Parameters	Loglikelihood
I	1	-414
II	2	-412
III	3	-411
IV	4	-409
V	6	-409

Determine the model favored by the Akaike Information criterion.

- A. I                      B. II                      C. III                      D. IV                      E. V

3. Five models are fitted to a sample of  $n$  observations with the following results:

Model	Number of Parameters	Loglikelihood
I	1	-235.9
II	2	-233.4
III	3	-231.8
IV	4	-229.5
V	6	-228.1

What is the largest  $n$  for which the Schwarz-Bayes and Akaike Information Criteria would choose the same model?

- A. 4                      B. 5                      C. 49                      D. 71                      E. 99

4. An actuary is trying to choose between which of five models to use. First she fit the parameters using the MLE based on a sample of  $n = 130$  observations with the following results:

Model	Number of Parameters	Loglikelihood
I	1	-355.8
II	2	-353.9
III	3	-350.6
IV	4	-349.1
V	6	-347.6

Which models are preferred by the Schwarz-Bayes (SBC) and Akaike Information (AIC) criteria?

- A. SBC prefers I, AIC prefers IV   B. SBC prefers IV, AIC prefers I   C. SBC prefers III, AIC prefers IV  
D. SBC prefers IV, AIC prefers III   E. Both prefer IV