HW E14 Chi-Square Goodness of Fit

Score: 0/10 0/4 answered

Question 1

You intend to conduct a goodness-of-fit test for a distribution with 8 categories. You collect data from 78 subjects.

What are the degrees of freedom for the χ^2 distribution for this test?

d.f. =

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Question 2

You are conducting a Goodness of Fit hypothesis test for the claim that all 5 categories are equally likely to be selected. Complete the table. Report all answers correct to three decimal places.

Category	Observed Frequency	Expected Frequency	(obs-exp)^2/exp
A	19		
B	17		
C	5		
D	11		
E	11		

What is the chi-square test-statistic for this data?

$\chi^2 =$

At the alpha = 0.05 level, what is the conclusion for this test?

- Fail to reject the null hypothesis
- Reject the null hypothesis

Report all answers accurate to three decimal places.

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Question 3

You are conducting a multinomial Goodness of Fit hypothesis test for the claim that the 4 categories occur with the following frequencies:

$$H_o: p_A = 0.15;\ p_B = 0.3;\ p_C = 0.15;\ p_D = 0.4$$

Complete the table. Report all answers accurate to three decimal places.

Category	Observed Frequency	Expected Frequency
A	12	
B	18	
C	19	
D	36	

What is the chi-square test-statistic for this data?

$\chi^2 =$

What is the P-Value?

P-Value =

For significance level alpha 0.01,

What would be the conclusion of this hypothesis test?

- Fail to reject the Null Hypothesis
- Reject the Null Hypothesis

Report all answers accurate to three decimal places.

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Question 4

6.42 Evolution versus Creationism: A Gallup Poll released in December 2010 asked 1019 adults living in the Continental U.S. about their belief in the origin of humans. These results, along with results from a more comprehensive poll from 2001 (that we will assume to be exactly accurate - i.e. *known* values), are summarized in the table below:

Response	Year: 2010	Year: 2001
Humans Evolved with God guiding (1)	38%	37%
Humans evolved but God had no part in the process (2)	16%	12%
God created humans in present form (3)	40%	45%
Other / No opinion (4)	6%	6%

(a) State hypotheses for the following research question: have beliefs on the origin of human life changed since 2001?

- Ho: the population follows the 2001 distribution
  Ha: the population doesn't follow the 2001 distribution
- the population follows the 2010 distribution
  Ha: the population doesn't follow the 2010 distribution
- Ho: the population follows the 2001 distribution
  Ha: the population follows the 2010 distribution

(b/c) Calculate the actual number of respondents in 2010 that fall in each response category as well as the expected number, assuming that the population follows the 2001 distribution. *(please round to the nearest whole number)*

Response	Observed 2010	Expected 2010
Humans Evolved with God guiding (1)		
Humans evolved but God had no part in the process (2)		
God created humans in present form (3)		
Other / No opinion (4)		

(d) Conduct a chi-square test and state your conclusion.

The value of the test statistic is: _____ *(please round to two decimal places)* The degrees of freedom for this test are: _____ The p-value for this test is: _____ *(please round to four decimal places)* State the conclusion of the test in the context of the problem:

- The data to not provide sufficient evidence to claim that the 2010 distribution is different than the distribution in 2001
- The data provide sufficient evidence to claim that the 2010 distribution is different than the distribution in 2001