A company is doing market research on a new product and have selected a random sample of potential customers to help choose the most effective TV commercial. Out of the 180 people in the sample 65 viewed the first version, 30 viewed the second version, and the remainder viewed the third. Of those who viewed the first version, 25 indicated that they were likely to buy the product while the rest said they were either unsure or unlikely to buy the product. For those viewing the second version, 20 said they were likely to buy the product and for the third 54 said the same.

* Necessary details including related formulas and corresponding numerical procedures must be presented.

* All numerical solution should be with two decimals.

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1. Identify the two concerned categorical random variables and their possible outcomes. ------------------------------------- 10pts

2. Produce the observed two way table. --15pts

3. Construct the expected two way table based on the above observed table.---15pts

4. Evaluate the observed chi square based on the above two tables. -- 20pts.

5. Determine the null distribution of the testing statistic. --- 10pts

6. Express the p-value of the observed chi square by using the null distribution --10pts

7. For a predetermined significance level $0<\alpha<1$, how do you draw a conclusion? -- 10pts

8. How do you interpret your conclusion in this context? -- 10pts