Statistics – Sample Questions, Chapter 5

1. State, in your own words, what the following terms mean
   a) Contingency Table
   b) row percentage
   c) column percentage
   d) expected value

2. Decide if the following statements are true or false.
   a) The expected values tell you what entries are expected in the cells of a contingency, or crosstabs, table if the variables are assumed to be independent.
   b) If you add up the column percentages across one row in a contingency, or crosstabs, table you get 100%.
   c) If you add up the row percentages across one row in a contingency, or crosstabs, table you get 100%.

4. The table below shows a contingency, or crosstabs, table for variables "DEGREE" by "RACE" (not generated by Excel, but a contingency table none-the-less). Each cell lists three numbers: the count, the row, and the column percentage, but for one cell the percentages are blocked out.

RS HIGHEST DEGREE * RACE OF RESPONDENT Crosstabulation

			RACE OF RESPONDENT			
			WHITE	BLACK	OTHER	Total
RS HIGHEST DEGREE	LT HIGH SCHOOL	Count	316	103	29	448
		% within RS HIGHEST DEGREE	70.5%	23.0%	6.5%	100.0%
		% within RACE OF RESPONDENT	13.5%	25.8%	19.2%	15.5%
	HIGH SCHOOL	Count	1283	213	71	1567
		% within RS HIGHEST DEGREE	81.9%	13.6%	4.5%	100.0%
		% within RACE OF RESPONDENT	54.7%	53.4%	47.0%	54.1%
	JUNIOR COLLEGE	Count	159	24	4	187
		% within RS HIGHEST DEGREE	85.0%	[redacted]	2.1%	100.0%
		% within RACE OF RESPONDENT	6.8%	[redacted]	2.6%	6.5%
	BACHELOR	Count	395	43	33	471
		% within RS HIGHEST DEGREE	83.9%	9.1%	7.0%	100.0%
		% within RACE OF RESPONDENT	16.8%	10.8%	21.9%	16.3%
	GRADUATE	Count	194	16	14	224
		% within RS HIGHEST DEGREE	86.6%	7.1%	6.3%	100.0%
		% within RACE OF RESPONDENT	8.3%	4.0%	9.3%	7.7%
Total		Count	2347	399	151	2897
		% within RS HIGHEST DEGREE	81.0%	13.8%	5.2%	100.0%
		% within RACE OF RESPONDENT	100.0%	100.0%	100.0%	100.0%

a) Which number is the count, the row, and the column percentage in each cell (in other words, is the top number to count, row, or column percentage, etc).

b) Out of all Blacks, how many have a high school degree, in percent?

c) Out of all Whites, how many have a graduate degree?

d) How many Blacks have at most a junior college degree (i.e. a junior degree, high school degree, or less than a high school degree), in percent?

e) What are the blocked-out percentages?

5. Use StatCrunch to compute a contingency table for “religious preference” versus “liberal or conservative”, using data from our “General Social Survey (GSS)”. Consider the entry in the cell for "Liberal and Catholic":

   a. What is the row percentage of that cell

   b. What is the column percentage of that cell

   c. What is the expected value of that cell

6. To investigate whether a relation exists between affiliation with a particular political party and the opinion on gun permits we used Excel to create the following contingency, or crosstabs, table, showing row percentages.

FAVOR OR OPPOSE GUN PERMITS * Party Affiliation Crosstabulation

% within FAVOR OR OPPOSE GUN PERMITS

		Party Affiliation				
		Democrat	Independent	Republican	Other	Total
FAVOR OR OPPOSE GUN PERMITS	FAVOR	35.7%	36.5%	26.5%	1.3%	100.0%
	OPPOSE	23.4%	39.5%	34.7%	2.4%	100.0%
Total		33.5%	37.0%	28.0%	1.5%	100.0%

a) Based on that table, do you think there is strong evidence that the two variables associated? Use common sense (which will likely be somewhat ambiguous), not mathematics

7. Suppose a contingency table has been created from a survey questioning people about their sex (gender) and opinion on gun control. The (fictitious) table is as follows:

	For	**Against**
Female	60	40
Male	50	80

a) Convert the table to a row percentage table

b) Convert the table to a column percentage table

c) Convert the table to a table of expected values

d) Is any expected value less than 5?