1. **A researcher wants to compare the mean age of 3 groups of new employees recruited for a new hospital: dentists, physicians, and nurse practitioners. The appropriate statistical test to use is:**
   a. Non-parametric; Kruskal Wallis H.
   b. Non-parametric; Pearson's Chi-square.
   c. Parametric; paired sample *t* test.
   d. Parametric; analysis of variance (ANOVA).

Parametric 3 samples independent

Summary Table of Statistical Tests

Level of Measurement	Sample Characteristics					Correlation
	1 Sample	2 Sample		K Sample (i.e., >2)		
		Independent	Dependent	Independent	Dependent	
Categorical or Nominal	X2	X2	Macnarmar's X2	X2	Cochran's Q	
Rank or Ordinal		Mann Whitney U	Wilcoxin Matched Pairs Signed Ranks	Kruskal Wallis H	Friendman's ANOVA	Spearman's rho
Parametric (Interval & Ratio)	z test or t test	t test between groups	t test within groups	1 way ANOVA between groups	1 way ANOVA (within or repeated measure)	Pearson's r
			Factorial (2 way) ANOVA			

2. **A researcher studied the association between quality of certain products (high quality, poor quality) and its' brand name (H&M, Zara, M&S, Atalla) using Chi-square. The degrees of freedom in this test equal:**
   a. 3
   b. 2
   c. 4
   d. 5

2 Rows
4 Columns

$$df = (R-1)(C-1)$$
$$= (2-1)(4-1) = 3$$

3. **The best decision given the following SPSS chi-square output of the relationship between age group (toddler, school-age, adolescents) and imagination (high, low) is to:**

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.821[a]	2	.244
Likelihood Ratio	2.815	2	.245
Linear-by-Linear Association	.832	1	.362
N of Valid Cases	606		

a. Reject null hypothesis.
b. Keep null hypothesis.
c. Accept alternative hypothesis.
d. There is a statistically significant association between age group and depression.

The probability of the chi-square test statistic (chi-square=2.821) was p=0.244, greater than the alpha level of significance of 0.05. The null hypothesis that differences in "age group" are independent of differences in "imagination" is not rejected.

4. **If sample A has 8 patients, and sample B has 11 patients, then degrees of freedom of this *t* -independent test equal:**
   a. 19
   b. 17
   c. 2
   d. 18

$df = N_1 + N_2 - 2$
$= 8 + 11 - 2 = 17$

5. **Use this this chi-square critical value table to answer the following question:**

	$P(X \leq x)$							
	0.010	0.025	0.050	0.100	0.900	0.950	0.975	0.990
r	$\chi^2_{0.99}(r)$	$\chi^2_{0.975}(r)$	$\chi^2_{0.95}(r)$	$\chi^2_{0.90}(r)$	$\chi^2_{0.10}(r)$	$\chi^2_{0.05}(r)$	$\chi^2_{0.025}(r)$	$\chi^2_{0.01}(r)$
1	0.000	0.001	0.004	0.016	2.706	3.841	5.024	6.635
2	0.020	0.051	0.103	0.211	4.605	5.991	7.378	9.210
3	0.115	0.216	0.352	0.584	6.251	7.815	9.348	11.34
4	0.297	0.484	0.711	1.064	7.779	9.488	11.14	13.28
5	0.554	0.831	1.145	1.610	9.236	11.07	12.83	15.09
6	0.872	1.237	1.635	2.204	10.64	12.59	14.45	16.81
7	1.239	1.690	2.167	2.833	12.02	14.07	16.01	18.48
8	1.646	2.180	2.733	3.490	13.36	15.51	17.54	20.09
9	2.088	2.700	3.325	4.168	14.68	16.92	19.02	21.67
10	2.558	3.247	3.940	4.865	15.99	18.31	20.48	23.21

A researcher calculated the value of chi-square to be = 5.991. If df = 2, and alpha = 0.05. Pick the correct statement of the followings:

a. The critical value of chi-square is greater than calculated value of chi-square. Thus, reject H_0.
b. Critical value of chi-square is smaller than calculated value of chi-square. Thus, keep H_0.
c. Critical value of chi-square is equal to the calculated value of chi-square. Thus, we don't have enough data to reject the H_0.
d. Critical value of chi-square is smaller than calculated value of chi-square. Thus, reject H_0.