1. What is the difference between statistic(統計量) and parameter(母數) used in Statistics? Describe briefly with examples. (10 %)

2. What is statistical estimator? Describe any three criteria used in Statistics to evaluate a good estimator to estimate the population parameter of interest. (10 %)

3. Describe three probability distributions. How do you use them in Statistics? (10 %)

4. What are the sources of statistical data and how do you examine your data prior to the application of statistical technique? (10 %)

5. Specify a sample space S for the results of three flips of a coin by listing the simple events in S and define a random variable for S. What is the probability distribution for this random variable? (10 %)

6. It has been estimated that employee absenteeism costs North American companies more than $100 billion per year. As a first step in addressing the rising cost of absenteeism, the personnel department of a large corporation recorded the weekdays during which individuals in a sample of 360 absentees were away over the past several months. At the 5% significance level, do these data suggent that absenteeism is higher on some days of the week than on others, given that the critical value $\chi^2 = 9.49$? (15 %)

Day of the Week	Monday	Tuesday	Wednesday	Thursday	Friday
Number Absent	86	60	70	68	76

7. A statistics professor hypothesized that not only would the means vary but so would the variances if the business statistics course was taught in two different ways but had the same final exam. He organized an experiment wherein one section of the course was taught using detailed PowerPoint slides, whereas the other required students to read the book and answer questions in class discussions. A sample of the marks were recorded and listed next. At the 5% significance level, can we infer that the variances of the marks differ between the two sections, given that the critical value is 3.72? (15 %)

Class 1	57	83	70	74	74	69	53	76	93	52	48
Class 2	92	57	55	76	54	76	65	82	77	75	64

8. How does an MBA major affect the number of job offers received? An MBA student randomly sampled 5 recent graduates in each of Finance, Marketing, and Management and asked each of them to report the number of job offers. Can we conclude at the 5% significance level that there are differences in the number of job offers between the three MBA majors, given that the critical value $F = 3.89$? (20 %)

Finance	Marketing	Management
5	8	5
3	7	6
2	7	5
2	8	5
4	9	3