1. (6%) Show that a variable measured by different scales, such as meter and centimeter, will have the same coefficient of variation.

2. Consider the number of accidents occurring on a street.
   (a) (6%) State the necessary properties for the number of accidents to follow a Poisson distribution.
   (b) (4%) If the number of accidents occurring each day follows a Poisson distribution with parameter $\mu = 0.01$, what is the probability that more than 1 accidents occur in 3 days?
   (c) (4%) One day, there is an accident occurred on the street 9:00am. What is the probability that the next accident will occur before 3:00pm that day?

3. (8%) In a real application for estimating a population proportion p, since p is unknown, how can we know that a sample size n is large enough to assume that the point estimator $\bar{p}$ follows a normal distribution?

4. (8%) If we consider both Type I error (μ_0 and α are known) and Type II error (μ_a and β are known) to perform hypothesis testing for a population mean, state the procedure of accepting or rejecting the null hypothesis when the population variance σ^2 is known.

5. The following sample information is given concerning the English-writing scores of high school seniors from two local schools.

School A	School B
$n_1 = 14$	$n_2 = 15$
$\bar{x}_1 = 25$	$\bar{x}_2 = 23$
$\sigma_1^2 = 16$	$\sigma_2^2 = 10$

   (a) (6%) Develop a 95% confidence interval estimate for the difference between the two populations, and interpret it. ($z_{0.05} = 1.645$, $z_{0.025} = 1.96$, $t_{0.05,27} = 1.703$, $t_{0.025,27} = 2.052$)
   (b) (4%) Are the two population means significantly different at the 5% level of significance?
   (c) (4%) Is there any necessary assumption for the above statistical inferences? Why or why not?

(背面仍有題目,請繼續作答)

6. a. (5%)A group of programmer was tested if they prefer some specific looping technique(ex.: For, Do, While). There are 90 programmer were randomly selected and same programming assignments were given to see which looping technique is used. The results were shown as below:

	Loop		
	For	Do	While
Observed frequency	23	36	31

Do the data present any evidence to show the programmers' preference if α=0.05 ($z_{0.01}$=0.0040, $z_{0.05}$=0.0199, $z_{0.99}$=0.3389, $z_{0.95}$=0.3289, $t_{0.01}(df=2)=6.965$ $t_{0.01}(df=3)=4.541$, $t_{0.05}(df=3)=2.353$, $t_{0.05}(df=2)=2.920$, $\chi^2_{0.05}(df=3)=7.81473$, $\chi^2_{0.01}(df=3)=11.3449$, $\chi^2_{0.05}(df=2)=5.99147$, $\chi^2_{0.01}(df=2)=9.21034$)?

b. (6%)In Regression analysis, we usually use two-tail t test and F test. What would be your null hypothesis for each test? What are the alternative hypothesis for the t tes and F test respectively? What are the purposes of them?

c. (39%) A partial computer output from a regression analysis follows.

The regression equation is

Salary = 389 + 2.12 East + 5.32 South - 24.1 North

Predictor	*Coef*	*SE Coef*	*T*
Constant	***A***	*66.09*	***E***
East	***B***	*1.214*	***F***
South	***C***	*0.9629*	***G***
North	***D***	*1.869*	***H***

S = 8.59782 R-Sq = 87.4% R-Sq(adj) = ***I***

Analysis of Variance

Source	*DF*	*SS*	*MS*	*F*
Regression	***J***	*12833.9*	***L***	*57.87*
Residual Error	*25*	*1848.1*	***M***	
Total	***K***	*14681.9*		

What are the values of A, B, C, D, E, F, G, H, I, J, K, L, and M?