科目：統計學　　　　　　　　　　　適用系所：管理研究所

注意：1.本試題共 1 頁，請依序在答案卷上作答，並標明題號，不必抄題。2.答案必須寫在指定作答區內，否則不予計分。

Total: 100 points.

A marketing researcher randomly selected 25 customers who entered one 7-11 located in the central area of Taipei city.　The mean and variance of their age both are 25 years old.

1. What is (1)standard deviation, (2)standard error, (3)standard score. Please briefly explain the meaning and computation formula of these terms, and then use the previous information of customers' age as examples to answer this question. (15 points)

2. Please briefly explain the meaning and features of (1)population distribution, (2)sample distribution, (3)sampling distribution.　And then indicate that the previous information about customers' age involve to which term and why. (15 points)

3. What would be the purpose and different function to adapt the (1)histogram, (2)box graph, (3)stem-and-leaf diagram to describe the distribution of customers' age. (15 points)

If the research also collected the age information of 25 customers who entered another 7-11 located in a countryside area with a mean of 35 years old and variance is 25. (Hint: the two-tailed critical value of t-distribution with df=48 and α=.05 is around 2)

4. What is the name and results of the testing if the customers' age of two areas differ significantly? (α=.05) (15 points)

5. The results of analysis of location and gender differences on the age of customer were listed in the following table.　What is the name of the analysis? Please also explain the meaning of each columns and discuss the conclusions of testing. (α=.05) (15 points)

Sources	SS	df	MS	F	P
A:Location	15	1	15	3.75	0.032
B:Gender	10	1	10	2.50	0.072
A×B	16	1	16	4.00	0.028
Error	184	46	4		
Total	225	49			

6. The results of using the age information to predict the amount of expense in the store shown that $Y'=46X+105$, R^2=.50 ($F(1,48)$=78.23 ($p<.001$). What is the name of the analysis? Please also explain the meaning of each values and discuss the conclusions of testing. (α=.05)(15 points)

7. Whether the conclusions of the previous question may involve the type I error or type II error? Please explain. (10 points)