所別：人力資源管理研究所碩士班 科目：經濟學與統計學

第一部份：經濟學

1. 什麼是完全競爭？請列舉其特性，請舉例說明，並請繪圖說明完全競爭情況下個別廠商與產業的供給與需求曲線。(10%)

2. 什麼是獨佔？寡佔？壟斷性競爭？台灣的 7-11 便利商店，加油站，電力公司，煉油業各屬那一類型的競爭？認清是那一類競爭對企業價格與競爭政策擬訂時有何種幫助？(20%)

3. 什麼是基本工資或最低工資？台灣已有很多年沒有調整基本工資，如果政府現在要調升基本工資，那些員工是受益者？那些是受害者？請繪圖說明。(10%)

4. 政府決定在 2006 年 1 月 1 日起多引進二萬名專門從事艱苦，困難與危險性工作的外勞，請問引進這些外勞對本地勞工的就業有何種影響？請繪圖說明。(10%)

注意：背面有試題

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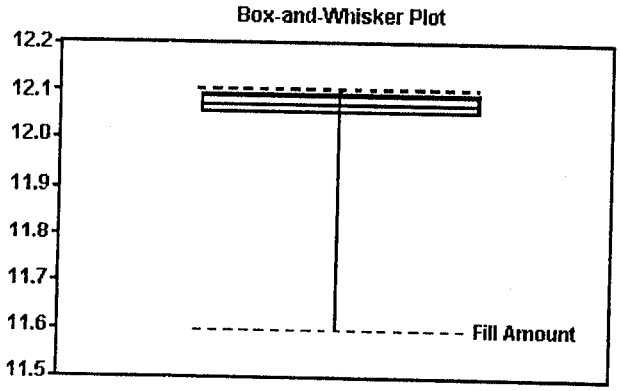
第二部分：統計學（共五十分）

I. MULTIPLE CHOICE. **Choose the one alternative that best completes the statement or answers the question.** （每題 3 分）

1) The boxplot shown below was constructed in Excel for the amount of soda that was poured by a filling machine into 12-ounce soda cans at a local bottling company.



Based on the information given in the boxplot below, what shape do you believe the data to have?

A) skewed to the left　　B) skewed to the center　　C) approximately symmetric　　D) skewed to the right

2) After completing an inventory of three warehouses, a golf club shaft manufacturer described its stock of 12,246 shafts with the percentages given in the table. Suppose a shaft is selected at random from the 12,246 currently in stock, and the warehouse number and type of shaft are observed.

	Type of Shaft		
	Regular	Stiff	Extra Stiff
1	19%	8%	3%
Warehouse 2	14%	16%	18%
3	4%	18%	0%

Given that the shaft is produced in warehouse 2, find the probability it has an extra stiff shaft.

A) 0.51　　B) 0.353　　C) 0.375　　D) 0.857

3) You and your friend have been assigned the project of estimating the average shareholder return of the companies in the Consumer Products industry. Before you begin working on the project, your friend and you get into a massive argument over whether or not your statistics class is the best class you have taken in your life (your friend thinks it is the second best). Not speaking, you both independently work on the project and both arrive at 95% confidence intervals using the knowledge from class. Just before the due date of the project, you reconcile and agree that, in fact, the class is the best you have ever taken, and now must decide what to do with the two separate intervals. Which choice would result in the best estimate of the average shareholder return.

A) Look at the endpoints of both intervals and report the larger of the lower endpoints and the smaller of the upper endpoints as the confidence interval for μ.

B) Use the interval that utilized the larger sample size.

C) Take both random samples and combine the information (deleting duplicates). Construct a 95% confidence interval of the combined data.

D) Use your interval, since you obviously are smarter than your friend.

4) A test of hypothesis was performed to determine if the true proportion of college students who preferred a particular brand of soda differs from .50. The ASP printout is supplied below. Note: All data refer to the proportion of students who preferred the brand of soda.

HYPOTHESIS: PROPORTION X = x

X = drink_(soda=1)

SAMPLE PROPORTION OF X = .419162
SAMPLE SIZE OF X = 167
HYPOTHESIZED VALUE (x) = .5

SAMPLE PROPORTION X - x = -.080838
Z = -2.08932
P-VALUE = .0366
P-VALUE/2 = .0183
SD. ERROR = .0386912

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第二部分：統計學（接續）

What assumptions are necessary for any inferences derived from this printout to be valid?

A) The sample proportion equals the population proportion.

B) The population proportion has an approximate normal distribution.

C) The sample was randomly selected from an approximately normal population.

D) None of these assumptions are necessary.

5) A real estate magazine reported the results of a regression analysis designed to predict the price (y), measured in dollars, of residential properties recently sold in a northern Virginia subdivision. One independent variable used to predict sale price is GLA, gross living area (x), measured in square feet. Data for 157 properties were used to fit the model

$$E(y) = \beta_0 + \beta_1 x.$$

The results of the simple linear regression are provided below.

$y = 96{,}600 + 22.5x \quad s = 6500 \quad r^2 = .77 \quad t = 6.1$ (for testing β_1)

Interpret the value of the test statistic, t = 6.1.

A) For every 1-sq ft. increase in GLA (x), we expect a property's sale price (y) to increase $6,100.

B) There is sufficient evidence (at $\alpha = .05$) to conclude that GLA (x) is a useful linear predictor of sale price (y).

C) There is insufficient evidence (at $\alpha = .10$) to conclude that GLA (x) is a useful linear predictor of sale price (y).

D) We expect to predict sale price (y) to within $12,200 of its true value using GLA (x) in a straight-line model.

6) The Central Limit Theorem is important in statistics because _____.

A) for any population, it says the sampling distribution of the sample mean is approximately normal, regardless of the sample size

B) for a large n, it says the sampling distribution of the sample mean is approximately normal, regardless of the population

C) for a large n, it says the population is approximately normal

D) for any size sample, it says the sampling distribution of the sample mean is approximately normal

7) A local eat-in pizza restaurant wants to investigate the possibility of starting to deliver pizzas. The owner of the store has determined that home delivery will be successful if the average time spent on the deliveries does not exceed 26 minutes. The owner has randomly selected 17 customers and has delivered pizzas to their homes. What are the hypotheses the owner should test to show that the pizza delivery will not be successful?

A) $H_0: \mu = 26$ vs. $H_a: \mu > 26$ B) $H_0: \mu = 26$ vs. $H_a: \mu \neq 26$ C) $H_0: \mu < 26$ vs. $H_a: \mu = 26$ D) $H_0: \mu = 26$ vs. $H_a: \mu < 26$

8) A certain HMO is attempting to show the benefits of managed health care to an insurance company. The HMO believes that certain types of doctors are more cost-effective than others. One theory is that both Primary Specialty and whether the physician is a foreign or USA medical school graduate are an important factors in measuring the cost-effectiveness of physicians. To investigate this, the president obtained independent random samples of 40 HMO physicians, half foreign graduates and half USA graduates, from each of four primary specialties-- General Practice (GP), Internal Medicine (IM), Pediatrics (PED), and Family Physician (FP)-- and recorded the total per-member, per-month charges for each. Thus, information on charges were obtained for a total of n = 160 doctors. The ANOVA results are summarized in the following table.

Source	df	SS	MS	F Value	Prob > F
Specialty	3	22855	7618	60.94	.0001
Medschool	1	105	105	0.84	.6744
Interaction	3	890	297	2.38	.1348
Error	152	18950	125		
Total	159	42800			

Interpret the test for interaction shown in the ANOVA table. Use $\alpha = 0.01$.

A) There is insufficient evidence at the $\alpha = 0.01$ level to say that primary specialty and medical school interact.

B) It is impossible to make conclusions about primary specialty and medical school interaction based on the given information.

C) There is sufficient evidence at the $\alpha = 0.01$ level to say that primary specialty and medical school do not interact.

D) There is sufficient evidence at the $\alpha = 0.01$ level to say that primary specialty and medical school interact.

注：背面有試題

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第二部分：統計學（接續）

9) In a comprehensive road test on all new car models, one variable measured is the time it takes a car to accelerate from 0 to 60 miles per hour. To model acceleration time, a regression analysis is conducted on a random sample of 129 new cars.

TIME60: y = Elapsed time (in seconds) from 0 mph to 60 mph
MAX: x_1 = Maximum speed attained (miles per hour)

Initially, the simple linear model $E(y) = \beta_0 + \beta_1 x_1$ was fit to the data. Computer printouts for the analysis are given below:

Interpret the 95% confidence interval (6.78, 7.23) shown on the printout below. Each answer begins with "We are 95% confident that ...".

PREDICTED/FITTED VALUES OF TIME60

LOWER PREDICTED BOUND	4.7493	LOWER FITTED BOUND	6.7776
PREDICTED VALUE	7.0057	FITTED VALUE	7.0057
UPPER PREDICTED BOUND	9.2621	UPPER FITTED BOUND	7.2338
SE (PREDICTED VALUE)	1.1403	SE (FITTED VALUE)	0.1153

UNUSUALNESS (LEVERAGE)	0.0103
PERCENT COVERAGE	95.0
CORRESPONDING T	1.98

PREDICTOR VALUES: MAX = 140.00

A) the increase in acceleration time for every 1 mile per hour increase in maximum speed falls between 6.78 and 7.23 seconds.

B) the mean acceleration time for all new cars falls between 6.78 and 7.23 seconds.

C) the acceleration time for a new car with a maximum speed of 140 miles per hour falls between 6.78 and 7.23 seconds.

D) the mean acceleration time for all new cars with a maximum speed of 140 miles per hour falls between 6.78 and 7.23 seconds.

10) A study was recently done that emphasized the problem we all face with drinking and driving. Four hundred accidents that occurred on a Saturday night were analyzed. Two items noted were the number of vehicles involved and whether alcohol played a role in the accident. The numbers are shown below:

	Number of Vehicles Involved			
Did Alcohol Play a Role?	1	2	3 or more	Totals
Yes	58	94	18	170
No	26	178	26	230
Totals	84	272	44	400

What proportion of the accidents involved more than a single vehicle?

A) 18/400 B) 44/400 C) 84/400 D) 316/400

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false. （每題 2 分）

Answer the question True or False.

11) When we take the information contained in the sample and make statements or predictions about all of the information in the population, we are utilizing the technique that is known as inferential statistics.

12) One drawback of pie charts, dot plots, stem-and-leaf displays and histograms is that no measure of reliability can be attached to a graph.

13) If A and B are independent events, then A and B are mutually exclusive also.

14) The Central Limit Theorem guarantees an approximately normal sampling distribution for the sample mean for large sample sizes, so no knowledge about the distribution of the population is necessary for this interval to be valid.

15) In a test of hypothesis, the sampling distribution of the test statistic is calculated under the assumption that the alternative hypothesis is true.

16) Two events, A and B, are independent if P(A and B) = P(A) × P(B).

17) A Type I error occurs when we accept a false null hypothesis.

18) The Method of Least Squares specifies that the regression line has an average error of 0 and has an SSE that is minimized.

19) The union of two events is the event that either event occurs or both the events occur together.

20) We do not accept H_0 because we are concerned with making a Type II error.