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(請於此線以下開始出題)

Part I (30%): Suppose we have two countries of equal size, Northland and Southland, and both produce and consume two goods, Food and Clothes. The productive capacity and efficiency of the two countries are such that if both of them devote all their resources to Food production, output will be as follows:

- Northland: 100 tonnes
- Southland: 200 tonnes

Conversely, if all of the resources of the two countries are allocated to the production of Clothes, output will be:

- Northland: 100 tonnes
- Southland: 100 tonnes

Assume that each of the two countries has the constant opportunity cost of production between the two products, and that both their economies have full employment at all times. Also, all factors of production are perfectly mobile within the two countries between clothing and food industries, but are immobile between the two countries. Finally the price mechanism must be working to provide perfect competition.

Quiz:

1. Which country holds an absolute advantage in the production of Food? (5%)
2. Which country holds an absolute advantage in the production of Clothes? (5%)
3. What is the opportunity cost for Northland? (5%)
4. What is the opportunity cost for Southland? (5%)
5. Which country has a comparative advantage in Food production? (5%)
6. Which country has a comparative advantage in the production of Clothes? (5%)

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Part II (20%): Following Part 1, to show that these different opportunity costs can lead to mutual benefit if the two countries specialize in production and trade, consider the following starting position. Both the two countries produce and consume only domestically. The volumes are:

**Production and consumption
before trade**

	Food	Clothes
Northland	50	50
Southland	100	50
World total	150	100

We examine the consequences of trade between the two countries. This example is given the production capability of each country, in order for trade to be worthwhile. Northland requires a price of at least one tonne of Food in exchange for one tonne of Clothes while Southland requires at least one tonne of Clothes for two tonnes of Food. It follows that the actual exchange price will be somewhere between the two countries. The remainder of the example works with an international trading price of one tonne of Food for 2/3 tonne of Clothes.

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Quiz:

7. If both the two countries completely specialize in the goods in which they have comparative advantages, their outputs will be: (please fill in the blanks at answer sheet, 10%)

Production after trade

	Food	Clothes
Northland		
Southland		
World total		

Using the exchange rate of one tonne of Food for $\frac{2}{3}$ tonne of Clothes, Northland and Southland are able to trade to yield the following level of consumption: (please fill in the blanks at answer sheet, 10%)

Consumption after trade

	Food	Clothes
Northland		
Southland		
World total		

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Part III (20%): A person is given the choice between a bet of either receiving \$100 or nothing, both with a probability of 50%, or instead, receiving some amount with certainty.

Quiz:

8. What is his preference when he is risk-averse, risk neutral, and risk-loving? (10%)
9. What are the expected value, certainty equivalent, and risk premium in this case? (10%)

Part IV (30%): Let the price function for the (duopoly) industry be $a - b(q_1 + q_2)$, where a, b are all fixed and positive parameters and product quantity is $q_i (i=1,2)$. Firm i have the cost structure $C_i(q_i)$. The profit of firm i is revenue minus cost. Revenue is the product of price and quantity, and cost is given by the firm's cost function, so profit is $\pi_i = (a - b(q_1 + q_2)) \times q_i - C_i(q_i)$.

Quiz:

10. To calculate the best response functions of the firms (10%) and find the Nash equilibrium (20%).

End of Examination

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個案 1

襪子鄉的掙扎

織襪產業聚集的彰化社頭鄉，是台灣織襪工業發展 50 年的大本營，在產業高峰的時期，其產量曾佔全台灣八成的生產量，舉凡男女用襪、褲襪、網襪、小孩及洋娃娃的襪子，其產品線的齊全，幾乎可說是全台灣每 10 個人有一半以上，腳上穿的就是來自社頭織出的襪子。社頭不僅供應國人的需求，它的襪品更是銷售全世界，外銷主要地區以歐美為主，中南美洲與中東等地為輔。

台灣織襪業高峰期是在十多年前，當時社頭全鄉從事製造業的有 3000 多人，其中二分之一是從事織襪業，織襪幾乎可說是全鄉運動。當在盛世時期，社頭鄉的街頭上，無論是三合院、透天厝或低矮的平房內，都隱藏著小型襪子工廠，每個家庭可能是一家襪子其中一部份或其中組件的代工廠，各家環節分工合作，負責單項生產，從編織、染色、縫合、定型、染色、包裝到運送，整個鄉串聯起來宛如一條完整的生產線。

這樣的家庭工廠，根據社頭鄉公所以往統計，鄉內 5 人以下的小型工廠佔總織襪廠的比例，從 1986 年的 32%，上升到 1998 年的 53%，而且 90% 是 30 人以下的小型工廠，這些上千家的織襪外銷貿易、代織廠，4、50 年來有如「螞蟻雄兵」般進行彈性式的外包合作策略，當訂單需求大的時候，這些小型工廠能立即組合有規模的大工廠，即時回應國外廠商的需求，所以台灣的襪子能在外銷市場闖出亮麗的天空。

而在 2005 年 WTO 取消紡織品配額後，全球化對襪子鄉的重擊，卻似乎在一瞬間發生。全球紡織業競爭更形激烈，紡織廠紛紛至大陸投資生產，以獲取更低廉的生產成本，賺取更高利潤，大陸現時已是全球最大紡品生產出口供應地。浙江省的諸暨大唐一年生產 90 億雙襪子，佔了世界三分之一襪子產量，而且人人領的薪資不到社頭人的四分之一。

儘管資金雄厚的企業能夠自行闖出國外的通路，但小工廠卻不能如此。織襪工業和國內多數的中小企業一樣，面臨全球化競爭的嚴厲挑戰。（資料來源：修改自貿易雜誌電子報 172 期、天下雜誌 317 期）

1. 中小企業如何因應全球化？（25 分）

2. 對於社頭鄉的織襪廠，你會給什麼建議？（25 分）

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個案 2

A Challenge at Antle Corporation

Antle Corporation is a large electronics and computer firm headquartered on the East Coast. It has more than 100,000 employees. Founded in 1912, Antle was generally regarded as the world's number-one designer and manufacturer of large computer equipment from the late 1940s until the late 1980s. At its peak, its share of the market was estimated at 80 percent.

The compensation system at Antle has evolved through the decades, and top managers as well as employees report high levels of satisfaction with it. The following are the essential elements of the compensation system:

- All jobs are evaluated using a point factor approach once every 5 years, with minor adjustments made in between evaluations to correct inequities.
- The company hires a consulting firm once a year to conduct a salary survey for benchmark jobs. The company's pay policy is to peg salaries at the 85th percentile of the market.
- There are 18 grade levels in the company. Employees increase their pay level mainly by moving up the corporate hierarchy over time. The typical employee remains three years in one job before being promoted to a job at the next grade level. All employees are hired at the entry level and are groomed within the company. Although promotions are ostensibly based exclusively on performance, in practice "time on grade" plays an important role in deciding who is ready to move up.
- Perquisites and special benefits are closely tied to grade level. Stock options, for instance, are available only to employees in grades 15 through 18.
- Pay and promotion decisions are highly centralized.
- The only variable compensation comes from a profit-sharing plan under which the company funds a retirement plan for each employee based on the firm's profitability over the preceding year.
- Although "pay for performance" is the company's official policy, most employees view job security and upward mobility over time as the main rewards offered by the firm.
- A strict pay-secrecy policy is in force.

For the past 10 years, Antle's market share has been declining at an average of 3 percent annually. Because labor costs are almost 70 percent of Antle's total costs, one of Antle's first actions is to examine the firm's compensation practices. (Source: adapted from Gomez-Mejia, Balkin, & Cardy, *Managing Human Resources*, 2007)

1. What are the pros and cons of Antle's compensation policies? (25分)
2. What recommendations would you offer Antle for redesigning the compensation system? (25分)

【中、英文作答皆可】

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MULTIPLE CHOICE. 100% (40 questions, 2.5% each, 6 pages)

Choose the one alternative that best answers the question.

- (1). For any event A , $P(A)$ stands for its probability.
- (2). For any random variable X , $E(X)$ and $V(X)$ stand for its mean and variance, respectively.
- (3). The conditional probability of event A given that event B occurs is denoted by $P(A|B)$.
- (4). The conditional expectation of the random variable X given that event B occurs is denoted by $E(X|B)$.

1. Consider two samples each of 20 observations. Suppose that the means, medians, and ranges of the two samples are the same.

- (1) The sample variances are the same. (2) The maximum values of the two samples are the same.
(3) The samples are from the same population. (4) Options 1, 2, and 3 do not hold in general.

2. Suppose $n (> 1)$ observations are drawn from a population that follows the exponential distribution of mean 10. Let m be the sample mean and M be the sample median.

- (1) $m \neq M$ (2) $m < M$ (3) $m = M$ (4) $m > M$

3. What is the median of the data shown in the stem and leaf plot on right hand side?

- (1) 2 (2) 7 (3) 67 (4) 72

Stem	Leave
5	0, 4, 6
6	1, 1, 7, 7, 8
7	0, 2, 2

The context for Questions #4 to #5: The XYZ index takes a value within 0 to 10. A company is *extreme* if its XYZ index value is less than 1 or greater than 9. Suppose that the XYZ index of company ABC follows the (continuous) uniform distribution in (0, 10). Let $W = 1$ if company ABC is extreme, and $= 0$ otherwise.

4. Find $E(W)$. (1) 0.01 (2) 0.1 (3) 0.2 (4) None of options 1, 2, 3
5. Find $V(W)$. (1) 0.04 (2) 0.14 (3) 0.2 (4) None of options 1, 2, 3

The context for Questions #6 to #8: A financial consultant provides three types of mutual funds, A, B, and C, for his clients. The probabilities that a client buys funds A, B, and C are 0.5, 0.3, and 0.2, respectively, independent of everything else. Further assume that for each client buying funds A, B, and C, the financial consultant earns 10, 15, and 20 units of money, respectively. The number of clients per day for the financial consultant follows the Poisson distribution of mean 4.

6. Find the expected value of the units of money that the financial consultant earns per day.
(1) 13.5 (2) 15 (3) 54 (4) 60
7. On a certain day, there are six clients and two of them buy fund A. Find the expected value of the units of money that the financial consultant earns that day.
(1) 54 (2) 81 (3) 88 (4) None of options 1, 2, 3
8. On a certain day, there are six clients and two of them buy fund A. Find the variance of the units of money that the financial consultant earns that day.
(1) 20 (2) 35 (3) 37.2 (4) None of options 1, 2, 3

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9. Let X follow the standard normal distribution. $F(x) = P(X \leq x)$. Which of the following options correctly describe $P(-2 \leq X \leq 1)$?

- (1) $F(2)-F(1)$ (2) $F(2)-F(1)$ (3) $F(1)-F(2)$ (4) None of options 1, 2, 3

10. As its degrees of freedom tends to infinity, a t distribution converges to

- (1) a chi-square distribution (2) an F distribution
(3) a normal distribution (4) None of options 1, 2, 3

The context for Questions #11 to #12: The table below gives the data for the Wilson two-sample test. Let W_1 be the sum of the ranks from the second sample.

first sample, four sample points	12.3	7.3	9.6	10.3
second sample, three sample points	5.3	11.2	4.8	---

11. For the above sample values, W_1 is equal to (1) 3 (2) 5 (3) 7 (4) 9

12. In general, W_1 is random. If the two samples are from the same population, what is $P(W \leq 8)$?

- (1) $3/35$ (2) $1/7$ (3) $6/35$ (4) $2/7$

13. Six pairs of tests are carried out on two non-normal populations. The non-parametric sign test is used to check the null hypothesis H_0 , that the two populations follow the same distribution, against H_1 , that the two populations follow different distributions. If H_0 is rejected when one population is five or six times better than the other, the type-1 error of the test is:

- (1) $7/64$ (2) $9/64$ (3) $7/32$ (4) $9/32$

14. Let $\bar{X} = \frac{X_1 + X_2 + \dots + X_n}{n}$, where X_1, \dots, X_n are independent and identically distributed.

- (1) $V(\bar{X}) < V(X)$ (2) $V(\bar{X}) = V(X)$ (3) $V(\bar{X}) > V(X)$ (4) Options 1, 2, 3 do not hold in general.

15. Let $U = X+Y$ and $W = X-Y$. The covariance of U and W is:

- (1) $V(X)-V(Y)$ (2) $V(X)+V(Y)$ (3) $V(X)+V(Y)-2\text{Cov}(X, Y)$ (4) None of options 1, 2, 3

The context for Questions #16 to #19: The joint distribution of X and Y are shown on the right-hand-side table.

		Y		
		-1	0	1
X	0	0.5	0	0.1
	1	0	0.1	0.3

16. Find $E(XY)$. (1) 0 (2) 0.3 (3) 0.4 (4) 0.5

17. Find $V(XY)$. (1) 0.21 (2) 0.23 (3) 0.25 (4) 0.27

18. Find $E(Y|X=0)$. (1) $-2/3$ (2) -0.4 (3) 0.4 (4) $2/3$

19. Find $V(Y)$. (1) 0.53 (2) 0.64 (3) 0.78 (4) 0.89

20. Let X and Y be dependent random variables and G be a real-valued function. Which of the following statement is true in general?

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(1) $E(X+Y) = E(X) + E(Y)$ (2) $E[G(X+Y)] = E[G(X)] + E[G(Y)]$
(3) $E(XY) = E(X)E(Y)$ (4) $E[G(XY)] = E[G(X)]E[G(Y)]$

21. The waiting time for air travelers is known to have a skewed-right distribution with a mean of 10 minutes and a standard deviation of 8 minutes. Suppose 100 flights have been randomly sampled. The sampling distribution of the mean waiting time for these 100 flights would be:

- (1) approximately normal with mean = 10 minutes and standard deviation = 0.8 minutes.
- (2) skewed-right with mean = 10 minutes and standard deviation = 8 minutes.
- (3) approximately normal with mean = 10 minutes and standard deviation = 8 minutes.
- (4) skewed-right with mean = 10 minutes and standard deviation = 0.8 minutes.

22. When determining the sample size for a proportion (p) for a given level of confidence and sampling error, the closer to 0.50 that p is estimated to be the _____ the sample size required.

- (1) smaller (2) larger
- (3) Sample size is not affected. (4) The effect cannot be determined from the information given.

23. It is desired to estimate the average total compensation of CEOs in the service industry. Data were randomly collected from 18 CEOs and the 97% confidence interval was calculated to be (\$2,181,260, \$5,836,180). Which of the following interpretations is correct?

- (1) We are 97% confident that the mean of the sampled CEOs falls in the interval \$2,181,260 to \$5,836,180.
- (2) 97% of the sampled total compensation values fell between \$2,181,260 and \$5,836,180.
- (3) We are 97% confident that the average total compensation of all CEOs in the service industry falls in the interval \$2,181,260 to \$5,836,180.
- (4) In the population of service-industry CEOs, 97% of them will have total compensations that fall in the interval \$2,181,260 to \$5,836,180.

24. The head librarian at the Library of Congress has asked her assistant for an interval estimate of the mean number of books checked out each day. The assistant provides the following interval estimate: from 740 to 920 books per day. If the head librarian knows that the population standard deviation is 150 books checked out per day, and she asked her assistant for a 95% confidence interval, approximately how large a sample did her assistant use to determine the interval estimate? ($Z_{0.025}=1.96$; $Z_{0.05}=1.645$)

- (1) 11 (2) 13 (3) 125 (4) 4

A student claims that he can correctly identify whether a person is a business major or an agriculture major by the way the person dresses. Suppose in actuality that if someone is a business major, he can correctly identify that person as a business major 87% of the time. When a person is an agriculture major, the student will incorrectly identify that person as a business major 16% of the time. Presented with one person and asked to identify the major of this person (who is either a business or agriculture major), he considers this to be a hypothesis test with the null hypothesis being that the person is a business major and the alternative that the person is an agriculture major. Answer questions 25-27.

25. Referring to the statement above, what would be a Type II error?

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- (1) Saying that the person is a business major when in fact the person is a business major.
(2) Saying that the person is an agriculture major when in fact the person is an agriculture major.
(3) Saying that the person is a business major when in fact the person is an agriculture major.
(4) Saying that the person is an agriculture major when in fact the person is a business major.

26. What is the value of type I error (α)? (1) 0.84 (2) 0.13 (3) 0.16 (4) 0.87

27. What is the power of the test? (1) 0.16 (2) 0.84 (3) 0.13 (4) 0.87

To test the effects of a business school preparation course, 8 students took a general business test before and after the course. The results are given below. Answer questions 28-30.

Student	Exam Score Before Course (1)	Exam Score After Course (2)
1	530	670
2	690	770
3	910	1,000
4	700	710
5	450	550
6	820	870
7	820	770
8	630	610

28. The number of degrees of freedom is: (1) 13 (2) 8 (3) 7 (4) 14

29. The value of the standard error of the difference scores (after-before) is:

- (1) 60.828 (2) 22.991 (3) 65.027 (4) 14.696

30. What is the test statistics for testing whether the business school preparation course is effective in improving exam scores?

- (1) 1.761 (2) 2.175 (3) 1.895 (4) 2.034

Primary Specialty is an important factor in measuring the cost-effectiveness of physicians. To investigate this, the president obtained independent random samples of 20 physicians from each of 4 primary specialties - General Practice (GP), Internal Medicine (IM), Pediatrics (PED), and Family Physicians (FP) - and recorded the total charges per member per month for each. A second factor influences total charges per member per month is whether the doctor is a foreign or USA medical school graduate. To investigate this, the president also collected data on 20 foreign medical school graduates in each of the 4 primary specialty types described above. So information on charges for 40 doctors (20 foreign and 20 USA medical school graduates) was obtained for each of the 4 specialties. The results for the ANOVA are summarized in the following table. Answer questions 31-32.

ANOVA					
Source	df	SS	MS	F	PR > F
Specialty	3	22,855	7,618	60.94	0.0001
Med school	1	105	105	0.84	0.6744
Interaction	3	890	297	2.38	0.1348
Error	152	18,950			
Total	159	42,800			

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31. Referring to the ANOVA Table above, what degrees of freedom should be used to determine the critical value of the F ratio against which to test for interaction between the two factors?

- (1) numerator df = 1, denominator df = 152
- (2) numerator df = 1, denominator df = 159
- (3) numerator df = 3, denominator df = 152
- (4) numerator df = 3, denominator df = 159

32. Referring to the ANOVA Table above, which of the following correctly interpret the interaction?

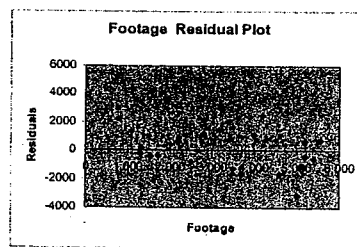
- (1) There is sufficient evidence to say at the 0.10 level of significance that the difference between the mean charges for foreign and USA graduates depends on primary specialty.
- (2) There is sufficient evidence at the 0.10 level of significance of a difference between the mean charges for foreign and USA medical graduates.
- (3) There is insufficient evidence to say at the 0.10 level of significance that the difference between the mean charges for foreign and USA graduates depends on primary specialty.
- (4) There is sufficient evidence to say at the 0.10 level of significance that mean charges depend on both primary specialty and medical school.

33. The least squares method of regression minimizes which of the following?

- (1) SST (2) SSE (3) SSR (4) all of the above

34. Based on the residual plot below, you will conclude that there might be a violation of which of the following assumptions?

- (1) Homoscedasticity (2) Normality of errors
- (3) Linearity of the relationship (4) Independence of errors



35. A Durbin-Watson statistic is utilized to examine which of the following assumption?

- (1) normality of the errors (2) homoscedasticity
- (3) independence of errors (4) none of the above

36. In a multiple regression involving two independent variables, if b_1 is computed to be 2, it means

- (1) the estimated average of Y increases by 2 units for each increase of 1 unit of X_1 , holding X_2 constant.
- (2) the relationship between X_1 and Y is significant.
- (3) the estimated average of Y increases by 2 units for each increase of 1 unit of X_1 , without regard to X_2 .
- (4) the estimated average of Y is 2 when X_1 equals zero.

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A microeconomist wants to determine how corporate sales are influenced by capital and wage spending by companies. She proceeds to randomly select 26 large corporations and record information in millions of dollars. The Microsoft Excel output below shows results of this multiple regression. Answer questions 37 and 38.

Summary Output

Regression Statistics	
Multiple R	0.830
R Square	0.689
Adjusted R Square	0.662
Standard Error	17501.643
Observations	26

ANOVA

	df	SS	MS	F	Significance F
Regression	2	15579777040	7789888520	25.432	0.0001
Residual	23	7045072780	306307512		
Total	25	22624849820			

	Coefficients	Standard Error	t Stat	P-value
Intercept	15800.0000	6038.2999	2.617	0.0154
Capital	0.1245	0.2045	0.609	0.5485
Wages	7.0762	1.4729	4.804	0.0001

37. Referring to the tables above, when the microeconomist used a simple linear regression model with sales as the dependent variable and wages as the independent variable, he obtained an r^2 value of 0.601. What additional percentage of the total variation of sales has been explained by including capital spending in the multiple regression?
- (1) 31.1% (2) 8.8% (3) 60.1% (4) 22.9%
38. Referring to the table above, one company in the sample had sales of \$20 billion (Sales = 20,000). This company spent \$300 million on capital and \$700 million on wages. What is the residual (in millions of dollars) for this data point?
- (1) 622.87 (2) -983.56 (3) -790.69 (4) 874.55
39. A real estate builder wishes to determine how house size (House) is influenced by family income (Income), family size (Size), and education of the head of household (School). House size is measured in hundreds of square feet, income is measured in thousands of dollars, and education is measured in years. The builder randomly selects 50 families and runs the multiple regression. The business literature involving human capital shows that education influences an individual's annual income. Combined, these may influence family size. With this in mind, what should the real estate builder be particularly concerned with when analyzing the multiple regression model?
- (1) normality of residuals (2) collinearity
(3) missing observations (4) randomness of error terms
40. Which of the following diagnostic tool is used to examine the possible effects arised in question 39?
- (1) the VIF. (2) the standard error of the estimate. (3) the Y intercept. (4) the slope.

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1. 請您以「國際市場進入與退出策略」角度，針對明基收購德國西門子手機部門為案例，分析及說明此購併成敗因素之所在。(25%)
2. 「終身僱用制」、「年功序列制」、「企業內工會」為日本式經營管理特徵，試說明此等特徵為何？若在您所服務企業實施此種管理方式，請提供您對實施成效或問題之看法。(25%)
3. 如果您是貴公司經營者，當公司追求「企業價值極大化」目標與股東追求「股東價值極大化」目標產生衝突時，試分別以服務「美式企業」及「台式企業」為例，提供您如何進行抉擇之參考依據。(20%)
4. 智慧財產權管理的目的在於保障企業內部投下的人力、物力、財力及時間等，所獲致的研發成果或無形資產。其內涵是如何將公司內部的研發成果或無形資產加以權利化以及如何妥善地運用已經權利化的智慧財產。針對不同形式的智財權管理標的，企業應如何建立合理運用與管理的方法。(30%)

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1. 針對明基 (BenQ) 購併西門子 (Siemens) 手機部門失敗個案，請以企業創新策略能力中的企業組織與文化的內涵分析。(60%)
2. What were the strategic changes to Allstate Chemical Company did or should pay attention? (40%)

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(請於此線以下開始出題)

The Company

Allstate Chemical in the 1970s

Allstate Chemical Company (ACC) produced commodity and specialty chemicals and distributed commodity chemicals for virtually every major chemical producer in the United States. Its distribution philosophy, supported by the largest distribution network in the country, was "Tell us what you want, and we will get it to you." ACC itself supplied about 15 to 20 percent of the product sold through its network. Distribution accounted for about half of total revenues. Another 15 percent of sales came from the production of diverse specialty chemicals such as adhesives, foundry products, and electronics chemicals, most of which ACC had acquired during the last decade. Like Allstate's existing divisions, these additions operated with considerable autonomy and possessed the full range of functions needed for P&L accountability. (See Exhibit 1.)

Relationship with the corporation. Allstate Chemical was a wholly owned subsidiary of the \$8 billion Allstate Oil Corp. (AOC). During most of the 1970s, according to Jack Cousins, who became president of ACC in mid-1983,

chemicals were not perceived as a significant growth or investment area. It was tacitly understood that our mission was to provide a positive cash flow to the corporation for use in other areas.

Refinery closings and divestment of some oil-producing properties in the late 1970s reduced the pressure on ACC to be a cash provider and generated funds for reinvestment in businesses other than oil. For the first time, chemical distribution and spe-

cialty chemicals were targeted for reinvestment and growth. Corporate expected a high return from the chemical business—12 to 13 percent ROI—as well as long-term growth. This sometimes produced conflicts: \$4 million per year for a development project, for example, translated into 1/2 percent less ROI.

Strategic shift toward specialty chemicals in the 1980s. Such pressures from AOC were one of several factors leading ACC management to decide that its future lay in specialty chemicals (coupled with a continued focus on distribution) rather than commodities. Because of differences between the two types of chemicals, major organizational and policy changes were required to support the shift.

Customers bought commodity chemicals to meet a specification and because the price was right. Products were generic, and the market determined their price. Purchasing departments made the buying decisions, largely on the basis of price, quality, and delivery. Commodities were sold to end users and fabricators. Because the cost of the chemical was a key part of these customers' costs, a supplier that was 1–2¢ high usually lost the business. This emphasis on cost led to in-house manufacturing, in which, one manager noted, "life revolves around the plant because low cost wins the game." Although high volume had brought ACC healthy profits, margins were less than for specialties, where performance set the price.

In specialties, the approach was usually to start from the customer's use and work backward. Applications were critical. Specialty chemicals were usually a small part of the price of the customer's product; as long as products performed as needed, business was not lost over pennies. Purchasing played a largely administrative role because deci-

EXHIBIT 1 Selected Financial Data (in millions)

	1985	1984	1983	1982	1981
Sales and operating revenues	\$1,500	\$1,500	\$1,200	\$1,200	\$1,300
Operating income	70	55	0	30	40
Identifiable assets	500	500	420	400	460
Funds provided from operations	60	50	20	45	50
Additions to plant, property, and equipment	40	20	20	30	35
Depreciation, depletion, and amortization	25	25	20	20	15

Note: All figures have been rounded.

SOURCE: 1985 Annual Report.

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sions to buy or specify critical ingredients were made by design engineers and plant people. These demands increased the need for marketing and technical staff. Because specialties were sold in the tens of millions of pounds per year rather than in billions, they were more likely to be made in batches than by continuous processes. This enormously reduced the scope and cost of capital investment—from hundreds of millions of dollars to tens of millions. But commodity plants could not be converted to specialty production. Specialties, however, allowed a company to forgo in-house manufacturing, particularly in the early, risky stages of a product's life. Cousins explained:

With an uncertain new product, why own a plant when you can rent a reactor? You would only want to bring manufacturing in-house if you had a well-established, high-volume product, or if you couldn't protect the technology, or if the manufacturing sequence was very complex and an outside company couldn't do it right or very consistently.

In specialties, ACC management felt it was important to be a leader rather than a follower. An early entrant could not only gain market share, set the price and ground rules, and gain lead time; it could also dictate the performance parameters a competitor would need to exceed to displace it. Later entrants had to provide significantly better performance, because their products were seldom "drop-ins" for the customer's equipment and process. Switching costs might include new molds or repiping and, most significantly, requalification testing, which could take years and cost millions of dollars. Second entrants also had to overcome reluctance to change from the known to the unknown.

Between 1980 and 1985, Allstate closed and sold several commodity businesses, including plants, and added specialties by acquiring and building facilities and using outside processors. Specialties doubled from 15 percent of Allstate's business to 30 percent, while distribution of commodities continued to account for about half of the company's sales. George Prince, general manager of the Polyesters Division, which now derived most of its profits from specialties, commented on what the changes had meant for his division.

You have much more exposure in the corporation when you're identified as a division that needs to be grown. We have made timely acquisitions that fit our technological and customer base, and we intend to

make more since the corporation is now willing to fund them. Our staff has increased dramatically. Two years ago, we did no market development. But now, for example, we are trying to get engineers to design in our resins for the Pontiac Firebird, and that requires marketing.

Specialties are also more quality oriented, and there's been more emphasis on how we control processes and how we report data to customers. For that reason, we do all of our own specialty manufacturing, and are investing in things like computer control of reactors. Our productivity has gone up because we're not making off-spec product.

Research, 1977-1986

Formation of Venture Research

Until 1977, Allstate Chemical had no significant central research organization. Small research groups in each division focused on short-term technical service to customers. Under the impetus of Cousins, who was then administrative vice-president for research, engineering, and finance, 25 percent of the company's research budget and people were pulled from the divisions to form Venture Research (VR).

VR's charter was to develop projects that would lead to major new businesses, with *major* defined as at least several hundred million dollars in annual sales. The group was to look for home runs outside existing division interests. Initially, Cousins and other senior managers wanted VR to focus on breakthrough process changes for producing high-volume, commodity chemicals. To head VR, Allstate recruited Dick Winthrop, whose process work at a competitor had won several industry awards.

Research strategy: From process/commodity focus to product/specialty. Process research required a broad range of chemical and engineering skills, a large commitment of people for long periods, and heavy investments in capital equipment. During the research stage, for example, this might mean building a series of reactors of increasing size, each of which could study a larger number of process variables. If the researchers succeeded in creating a commercially viable reaction, engineers would then have to create the equipment to make it. Process research typically started with petrochemicals that could be refined from crude oil (such

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as benzene), and sought cheaper ways to produce derivative monomers (such as styrene) or polymers (such as polystyrene), by significantly reducing the costs of raw materials, of capital, or both.¹

VR's initial strategy aimed to replicate what Winthrop had accomplished at Sohio. Process changes had so dramatically lowered Sohio's price for a high-volume monomer that they had "knocked the bottom out of the market," as one manager put it. Although Allstate did develop two new processes, neither achieved commercial success. In one case, the cost advantage was not large enough; in the other, ACC had to compete with potential customers' captive monomer production. The 1981-83 industry recession and the domestic industry's shift to offshore production dealt the final blows to ACC's process/commodity research strategy. Cousins ruefully acknowledged: "It took five years and \$50 million to see that this was the wrong way to go."

As process research was cut back, VR slowly gravitated toward product/specialty research. By 1984, its charter had shifted to supporting and strengthening the divisions. Prince described Polyesters' changing relationship to VR:

We used to do almost no new product development; what we did was hand-holding, fire-fighting, and low-level product improvement to satisfy specific customer needs. Now we are identifying market opportunities and developing new chemistries for which we want VR's expertise. We want them to do original chemistry, to invent new polymers that we develop for the market. Therefore, we need close contact to see that they are on track—we don't want them doing any blue-sky stuff. So when we see an opportunity for expanding our product line, I lobby Jack and the others, and they go to Dr. Winthrop and tell him to work on it.

Less capital intensive than process research, polymer research normally involved working with a certain type of chemistry (such as esters, urethanes, or alcohols) to produce either an entirely new molecule or improvements in the performance of existing molecules. Results were typically the product of years of studying such basic phenomena as what

¹Monomers are small molecules (i.e., molecules having low molecular weight), usually in liquid form. Also called resins or prepolymers, they are an intermediate product that needs further processing (polymerization plus molding into a part) to make a final product. Monomers are the bricks and mortar for constructing the polymer "house." Polymers are large molecules that have been put together to create a solid material that, when molded, has desired properties such as stiffness or strength.

made adhesives work. According to Cousins, the shift in research strategy was brought about by a combination of "SEP oversight, reviews of projects, yelling, and handholding."

Strategic Expansion Project (SEP) Board

Shortly after becoming president, Cousins established the Strategic Expansion Project Board to oversee research. Its members were Cousins and five group vice presidents, and its charter was to identify and fund those research projects that had significant strategic and commercial potential. The board looked for projects that fit Allstate's strength in technology or markets, and could open up new businesses. Such projects had to be more than mere line extensions, which remained the responsibility of divisions. VR could still fund projects at a relatively low level from its own budget, but continued funding, or significant expansions of the work, required board approval. SEP-approved projects were funded from "Jack's budget" until they broke even.

With this mechanism, the company's chief operating officers supported the start-up costs of new businesses from company rather than division profits, and exercised control over funding. If necessary, the board could kill a project that was not showing significant progress or whose commercial potential had waned. Cousins was satisfied that commercial considerations now guided Allstate's research in new areas. He noted, however, that "Dick Winthrop doesn't totally approve of this approach. There are areas he would like to expand that don't have a chance of succeeding commercially. But he knows that I will not approve a test-tube project." Winthrop conceded that "they have shelved a few projects I would like to have continued," but pointed out the board's usefulness in giving VR direction:

They advise us of areas to keep away from and give me guidance on time frames and capital expenditures so that I, in turn, can provide better guidance to the projects. The cross-play between divisions is valuable, and they may see areas we don't know about. But I would like them to do more in the way of suggesting areas of R&D that would be good for Venture Research.

One of VR's earliest polymer projects—and one that did gain SEP approval—was eventually commercialized as Dynarim. In the beginning, however, Dynarim was a molecule without a purpose or a home.

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I. Multiple-Choice Questions (1.5 points per question, 48%)

Please choose the best answer.

1. _____ focuses on the development of mathematical models to study management behavior.
1) Administrative management 2) Scientific management
3) Classical management thought 4) System theory
5) Management science
2. If a manager has two employees who commit the same offense, but he realizes that he should take a different approach to correcting the behavior of each person, he obviously understands the concept of
1) human relations thought 2) contingency perspective
3) Theory X 4) Fayol's management principles
5) transactional theory of leadership
3. Mercedes-Benz building a plant in Alabama to build its SUVs is an example of
1) direct investment 2) joint venture
3) strategic alliance 4) licensing
5) outsourcing
4. Which of the following is a correct statement?
1) To change organizational culture, managers do not necessarily need a clear idea of what they want to create.
2) The culture of an organization can easily be measured objectively.
3) The values held by an organization's founder(s) are often among the major determinants of corporate culture.
4) With the exception of language differences, cultural differences are not likely to cause problems for managers.
5) None of these.
5. When Ford Company specializes in assembling automobiles for the mass market, it is pursuing a(n)
1) BCG strategy 2) overall cost leadership strategy
3) vertical integration 4) focus strategy
5) tactical strategy
6. When 7-Eleven sets a goal for the number of retail outlets it will open within the next two years, it is engaged in determining
1) its mission statement.
2) a functional plan.
3) a corporate-level strategy.
4) a business-level strategy.
5) its distinctive competence.
7. The disadvantage of group decision making that results from the desire for consensus and cohesiveness is known as _____
1) groupthink 2) collectivism
3) cognitive dissonance 4) domination
5) irrationality

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- 5
8. You are part of making a decision about the appropriateness of discontinuing research on a new drug would save lives, but it is uncertain whether you can develop it within a reasonable time frame and at a reasonable cost. Your firm has already spent a small fortune on this drug. You have gathered so much information in preparation to making the decision that you are unable to sort the good information from the superfluous. You decide to rely on judgmental shortcuts in order to make the decision in a timely manner. These shortcuts are termed
- 1) fundamental attribution errors. 2) optimal solutions.
3) lateral approaches. 4) intuition.
5) heuristics.
- 10
9. Refer to the case mentioned above. You decide to spend more money on the project because you believe you might be viewed as responsible if the project failed. You are guilty of:
- 1) compulsion. 2) representative heuristic.
3) escalation of commitment. 4) satisficing.
5) self-serving bias.
- 15
10. Starbucks Coffee decides to exploit an opportunity in the marketplace before any other coffee chain store exploits it is called
- 1) a niche 2) a first-mover advantages.
3) an established market. 4) a franchise agreement.
5) vertical integration.
- 20
11. Which of the following is NOT an advantage of the sole proprietorship form of business ownership?
- 1) Simple and inexpensive to start
2) Profits are taxed only as ordinary income to the owner
3) Liability is limited to the amount of money invested in the business
4) Freedom in conducting business
5) All of these.
- 25
12. The innovation strategy is characterized by
- 1) avoiding unnecessary costs.
2) a mixture of loose with tight properties.
3) tight controls over current activity.
4) low specialization and low formalization.
5) extensive departmentalization.
- 30
13. Which of the following generalizations about organizational structures and employee performance and satisfaction is most true?
- 1) There is fairly strong evidence linking decentralization and job satisfaction.
2) It is probably safe to say that no evidence supports a relationship between span of control and employee performance.
3) The evidence generally indicates that work specialization contributes to lower employee productivity.
4) No one wants work that makes minimal intellectual demands and is routine.
5) The evidence generally indicates that the matrix organizational design leads to employees' high performance and creativity.
14. _____ is addressed by asking the question "On what basis will jobs be grouped together?"
- 1) Departmentalization 2) Work specialization
3) Centralization and decentralization 4) Formalization
5) Internalization
- 30

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30. Which one of the following may be disadvantage to generate the innovative alternatives?

- | | |
|------------------------------------|----------------------------|
| 1) face-to-face interacting groups | 2) brainstorming |
| 3) Delphi technique | 4) nominal group technique |
| 5) member diversity | |

31. Suggestion boxes, employee attitude surveys, and grievance procedures are examples of

- | | |
|-----------------------------|------------------------------|
| 1) horizontal communication | 2) managerial communication |
| 3) downward communication | 4) directional communication |
| 5) upward communication | |

32. The management pioneer who did the Hawthorne studies was

- | | |
|---------------------|-------------------|
| 1) Frederick Taylor | 2) Elton Mayo |
| 3) Henri Fayol | 4) Abraham Maslow |
| 5) Hugo Munsterberg | |

II. Essay Questions (52%)

Q1: This is a report from USAS (United Students Against Sweatshops) website. Please make a brief translation in Chinese (10%) and comment on it (10%).

USAS' Ethical Contracting Campaign seeks to expand the leverage that students have obtained over licensing to other areas in which educational institutions do business, such as purchasing, contracting, and investing. As such, USAS members have led successful campaigns to kick Coca-Cola off college campuses in response to their violent union busting tactics in Colombia, and have carried out campaigns to have their educational institutions cut their contracts with Mt. Olive Pickles and Taco Bell due to the horrific exploitation of their agricultural workers. The Mt. Olive Pickle boycott was successful in helping to foster the creation of the first guest farm worker union in United States' history. The Taco Bell boycott was victorious in generating an historic agreement between Yum Brands (the largest restaurant company in the world to which Taco Bell is a subsidiary) and the Coalition of Immokalee Workers (a Farm worker organization in Florida) through which the farm workers involved received their first wage increase since 1979 and a commitment to improved conditions in the fields. USAS members are currently developing a code of conduct to protect the rights of all workers involved connected to our campus communities.

Q2: 請說明明基(BenQ)為何購併西門子(Siemens)手機部門的可能考慮因素(10%)，以及評析這項購併案終究失敗的原因(10%)。

Q3: 常見之有效溝通障礙有哪些類型，請舉例說明之(12%)。