



Part I. Microeconomics (each question 5 point); answer the following questions pointedly.

1. A New York City cab driver appears to be making positive profits in the long run after carefully accounting for the operating and labor costs. Does this violate the competitive model? Why or why not?
2. True or false? The only reasonable long-run level profits for a competitive firm that has constant returns to scale at all levels of output is a zero level of profits.
3. The technical rate of substitution between factors  $x_2$  and  $x_1$  is  $-4$ . If you desire to produce the same amount of output but cut your use of  $x_1$  by 3 units, how many more units of  $x_2$  will you need?
4. Given the Paasche quantity index is less than 1. What can you conclude about how well-off the consumer is at time  $t$  compared to his situation at base time  $b$ ?
5. Given the consumption data,

Observation	$P_1$	$P_2$	$X_1$	$X_2$
1	1	2	1	2
2	2	1	2	1
3	1	1	2	2

How can you say about the consumer's preference?

6. Show mathematically that a monopolist always sets its price above marginal cost.
7. State the First Theorem of Welfare Economics and its implications for the competitive markets.
8. Suppose that one individual's demand curve is  $D_1(p)=20-p$  and another individual's is  $D_2(p)=10-2p$ . What is the market demand function?
9. If a consumer has a utility function  $u(x_1, x_2)=x_1 x_2^4$ , what fraction of her income will she spend on good 2?
10. Draw the indifference curves for the utility function  $u(x_1, x_2)=\ln x_1 + x_2$ .



Part II. Macroeconomics: answer the following questions pointedly

True or false? Explain your answer.

1. If both government spending and taxes increase by the same amount, the IS curve does not shift. (8 points)
2. Budget deficits cause trade deficits..(9 points)
3. In the absence of changes in fiscal and/or monetary policy, the economy will always remain at the natural level of output.(8 points)
4. According to the Phillips curve relation, the sacrifice ratio is independent of the speed of disinflation.(8 points)
5. Capital accumulation does not affect the level of output in the long run. Only technological progress does.(8 points)
6. The higher the saving rate, the higher consumption in steady state.(9 points)



注意：每一題十分，請詳細作答於答案卷上，否則該題不予計分！！

1. 試找出  $x$  值為何，可令無窮級數  $\sum_{n=1}^{\infty} (\ln x)^n$  收斂？
2. 試找出  $f(x) = \frac{1}{\sqrt[4]{16-x}}$  的馬克勞林級數 (Maclaurin series) 及其收斂半徑。
3. 試求  $\lim_{(x,y) \rightarrow (0,0)} \frac{xy^2}{x^2 + y^4} = ?$
4. 試找出製造一公升圓柱密封鐵罐，所需鐵片最少面積為何？
5. 當  $p$  值為何時，可令  $\int_1^{\infty} \frac{1}{x^p} dx$  收斂？
6. Estimate the maximum error in the approximation  $\sqrt[3]{1+x} \approx 1 + \frac{1}{3}x$ , if  $|x| < 0.001$ .
7. Find the equation of the tangent line at  $P(1, -1)$  on the graph of the curve of  $(x + 2y)^3 - 3xy - 2 = 0$ .
8. What is the smallest possible slope for a tangent to  $y = x^3 - 3x^2 + 5x + 1$ ? Also, find its equation.
9. Calculate the improper integral  $\int_{-\infty}^{+\infty} \exp\left(-x^2 - \frac{1}{x^2}\right) dx$ , where  $\exp(t) = e^t$ , if it converges. (You can use the fact that  $\int_{-\infty}^{+\infty} \frac{1}{\sqrt{2\pi}} \exp(-u^2/2) du = 1$ .)
10. Let  $z = f(x, y) \geq 0, \forall x, y \in \mathbb{R}$  and  $\int_{-\infty}^{+\infty} \int_{-\infty}^{+\infty} z dx dy = 1$ . And define that

$$\begin{aligned} \bar{x} &\equiv \int_{-\infty}^{+\infty} \int_{-\infty}^{+\infty} xz dy dx < +\infty \\ \bar{y} &\equiv \int_{-\infty}^{+\infty} \int_{-\infty}^{+\infty} yz dx dy < +\infty \\ C_{xy} &\equiv \int_{-\infty}^{+\infty} \int_{-\infty}^{+\infty} (x - \bar{x})(y - \bar{y}) z dx dy < +\infty \end{aligned}$$

Now, given  $w = h(y)$ , where  $h$  is bounded and  $h' > 0$ , then show that if  $C_{xy} > 0$ , then  $C_{xw} > 0$ .



1. Bowl C contains 12 red chips and 8 blue chips. Ten of these 20 chips are selected at random and without replacement and put in bowl D, which was originally empty. Two chips are then drawn at random from bowl D. Given that these two chips are blue, find the conditional probability that 4 red chips and 6 blue chips were transferred from bowl C to bowl D. \_\_\_\_\_ (10 points)
2. A certain type of aluminum screen that is 2 feet wide has on the average one flaw in a 100-foot roll. Find the probability that a 50-foot roll has no flaws. \_\_\_\_\_ (10 points)
3. A random sample of size 8 from  $N(\mu, 72)$  yielded  $\bar{x}=85$ . Find the 95% confidence intervals for  $\mu$ . \_\_\_\_\_ (10 points)
4. Assume that the weight of cereal in a "10-ounce box" is  $N(\mu, \sigma^2)$ . To test  $H_0: \mu = 10.1$  against  $H_1: \mu > 10.1$ , we take a random sample of size  $n=16$  and observe that  $\bar{x} = 10.4$  and  $s = 0.4$ . What is the approximate p-value of this test? \_\_\_\_\_ (10 points)
5. In a large bin of crocus bulbs it is claimed that 1/4 will produce yellow crocuses, 1/4 will produce white crocuses, and 1/2 will produce purple crocuses. If 40 bulbs produced 6 yellow, 7 white, and 27 purple crocuses, what is the value of the  $\chi^2$  statistics? \_\_\_\_\_ (10 points)
6. Let the random variables X and Y have the joint p.d.f.
 
$$f(x, y) = x + y, \quad 0 < x < 1, 0 < y < 1.$$

$$= 0 \quad \text{elsewhere.}$$
  - [a] Compute the variance of X. \_\_\_\_\_ (5 points)
  - [b] Compute the correlation coefficient of X and Y. \_\_\_\_\_ (5 points)



7. A simple regression produces the regression equation  $\hat{Y} = 5X + 7$ .

[a] If we add 2 to all the X values in the data (and keep the Y values the same as the original), what will be the new regression equation be? \_\_\_\_\_. (3 points)

[b] If we add 2 to all the Y values in the data (and keep the X values the same as the original), what will be the new regression equation be? \_\_\_\_\_. (3 points)

[c] If we multiply all the X values in the data by 2 (and keep the Y values the same as the original), what will be the new regression equation be? \_\_\_\_\_. (2 points)

[d] If we multiply all the Y values in the data by 2 (and keep the X values the same as the original), what will be the new regression equation be? \_\_\_\_\_. (2 points)

8. Let the random variables X and Y have the joint p.d.f.

$$f(x, y) = x + y, \quad 0 < x < 1, 0 < y < 1.$$

$$= 0 \quad \text{elsewhere.}$$

[a] Compute the variance of X. \_\_\_\_\_. (5 points)

[b] Compute the correlation coefficient of X and Y. \_\_\_\_\_. (5 points)

9. A recent study by *What Mortgage?* A British personal finance magazine, found that of 72 lenders, the 25 offering the best value were mutuals. Their rates were, on average, 1% lower than those of nonmutuals. Here the sample size of mutuals,  $n_1$ , is 25, and the sample size of nonmutuals,  $n_2$ , is  $72 - 25 = 47$ . Assume the sample standard deviation of rates offered by mutuals,  $S_1$ , equal to that of rates offered by nonmutuals  $S_2$ , and  $S_1 = S_2 = 2\%$ .

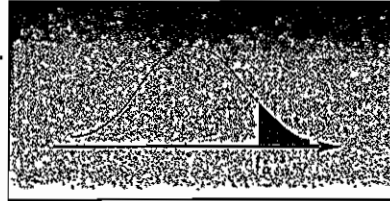
[a] Compute the test statistic for testing whether the rates offered by mutuals and nonmutuals, on average, statistically different. \_\_\_\_\_. (5 points).

[b] Should we conclude the difference between the rates offered by mutuals and nonmutuals under a 5% significance level in a two-tailed test? \_\_\_\_\_ (5 points).



10. Consider the use of metal detectors in airports to test people for concealed weapons. In essence, this is a form of hypothesis testing.
- [a] What is the null hypothesis? \_\_\_\_\_. (2 point)
  - [b] What is the alternative hypothesis? \_\_\_\_\_. (1 point)
  - [c] What are type I errors in this case? \_\_\_\_\_. (2 point)
  - [d] What are type II errors in this case? \_\_\_\_\_. (1 point)
  - [e] If the sensitivity of the metal detector is increased, how would the probabilities of type I errors be affected? \_\_\_\_\_. (2 point)
  - [f] If the sensitivity of the metal detector is increased, how would the probabilities of type II errors be affected? \_\_\_\_\_. (2 point)





Degrees of Freedom	$t_{.100}$	$t_{.050}$	$t_{.025}$	$t_{.010}$	$t_{.005}$
1	3.078	6.314	12.706	31.821	63.657
2	1.886	2.920	4.303	6.965	9.925
3	1.638	2.353	3.182	4.541	5.841
4	1.533	2.132	2.776	3.747	4.604
5	1.476	2.015	2.571	3.365	4.032
6	1.440	1.943	2.447	3.143	3.707
7	1.415	1.895	2.365	2.998	3.499
8	1.397	1.860	2.306	2.896	3.355
9	1.383	1.833	2.262	2.821	3.250
10	1.372	1.812	2.228	2.764	3.169
11	1.363	1.796	2.201	2.718	3.106
12	1.356	1.782	2.179	2.681	3.055
13	1.350	1.771	2.160	2.650	3.012
14	1.345	1.761	2.145	2.624	2.977
15	1.341	1.753	2.131	2.602	2.947
16	1.337	1.746	2.120	2.583	2.921
17	1.333	1.740	2.110	2.567	2.898
18	1.330	1.734	2.101	2.552	2.878
19	1.328	1.729	2.093	2.539	2.861
20	1.325	1.725	2.086	2.528	2.845
21	1.323	1.721	2.080	2.518	2.831
22	1.321	1.717	2.074	2.508	2.819
23	1.319	1.714	2.069	2.500	2.807
24	1.318	1.711	2.064	2.492	2.797
25	1.316	1.708	2.060	2.485	2.787
26	1.315	1.706	2.056	2.479	2.779
27	1.314	1.703	2.052	2.473	2.771
28	1.313	1.701	2.048	2.467	2.763
29	1.311	1.699	2.045	2.462	2.756
30	1.310	1.697	2.042	2.457	2.750
40	1.303	1.684	2.021	2.423	2.704
60	1.296	1.671	2.000	2.390	2.660
120	1.289	1.658	1.980	2.358	2.617
$\infty$	1.282	1.645	1.960	2.326	2.576





1. 何謂『官鏟大戰』？(10point)
2. 請從『公司治理』的角度審視博達事件。(10point)
3. 何謂 REIT 與 REAT？二者有何不同？(10point)
4. BRICs 乃投資界當紅的產品，為什麼？(10point)
5. 何謂分割式債券？金管會之所以推動它是基於什麼理由？(10point)
6. 試回答下列有關國際油價與美元貶值問題：(10point)
  - (a) 國際油價近來持續上漲，試從供給與需求角度，分析國際油價上漲的原因。
  - (b) 在考量美國目前面對預算與貿易雙赤字下，試分析國際油價上漲是否會造美元繼續的貶值。(10point)
7. 近年一家銀行經理管理其機構時，越來越強調風險的重要性，試回答：
  - (a) 當我們說一家銀行的風險很大時，從風險管理角度上，它確切代表的意義是什麼？(5point)
  - (b) 國際清算銀行(Bank for International Settlements 或 BIS)對銀行重視風險管理有何影響？(10point)
8. 未來是一個知識經濟時代，企業經營管理模式因而改變許多，試列舉一個你(妳)所知的目前企業經營管理模式上重大改變之項目，說明該改變項目與知識經濟的關係。(15point)