

# 國立中山大學 95 學年度碩士班招生考試試題

科目：總體經濟學【經濟所碩士班】

共 2 頁 第 / 頁

## 國立中山大學經濟學研究所碩士班招生考試「總體經濟學」試題

95 學年度

壹、請依題意選出正確答案 (40%，每題各 5 分)

請注意：第 1 - 6 題為單一選擇，第 7 - 8 題為多重選擇。

1. Real GDP measures the (a) value of final market output in current dollars. (b) changes in the prices of output in current dollars. (c) general upward drift in consumer prices. (d) quantity of output produced in constant dollars.
2. Potential GDP is the (a) output produced by the economy with fully employed resources. (b) current level of output produced in the economy. (c) level of output produced when the economy is in a recession. (d) level of output produced when the economy is at a peak.
3. During a recession (a) exports rise. (b) imports rise. (c) exports fall. (d) imports fall.
4. Which of the following is *not* a cost of more rapid economic growth? (a) Current consumption must be lost in order to develop new technology or new capital. (b) Environmental damage may increase. (c) Higher quality goods will be produced in the future as a result of new technologies. (d) Jobs and consumption patterns change more rapidly.
5. During a period of high inflation people increasingly devote resources to predict the inflation rate, which represents (a) the 'high nominal interest rate' effect. (b) why unemployment rises substantially during these episodes. (c) why the foreign exchange rate falls in value during these times. (d) a cost of inflation.
6. Business cycles have two phases. These are (a) a recession and a trough. (b) an expansion and a peak. (c) an expansion and a recession. (d) a peak and a trough.
7. An economic model is a description of some aspect of the economic world that (a) excludes features not needed for the purpose at hand. (b) is better if it includes most of the detail of the real economy. (c) relies on abstraction. (d) makes no assumptions that have not been proved.
8. Which statement(s) of the following about money is(are) correct? (a) The most direct way in which money replaces barter is through its use as a unit of account. (b) To qualify as money, a commodity may have a value in exchange either equal to or greater than its intrinsic value. (c) During an inflation, the real value of a commodity used as money remains constant, by definition. (d) Money is most useful as a store of value when the nominal rate of interest equals the real rate of interest.

# 國立中山大學 95 學年度碩士班招生考試試題

科目：總體經濟學【經濟所碩士班】

共 2 頁 第 2 頁

貳、請回答下列問題 (60%, 每題各 30 分)

一、何謂「古典不一致(classical inconsistency)」? (10%)

總體經濟理論的主要學派對於脫離古典不一致的困境, 各有何重要看法或主張? (20%)

二、請依據新古典成長理論(neo-classical growth theory) 及以下給定之資料, 建立模型以計算出:

1. 長期均衡之「每人資本量  $k^*$ 」與「每人產出水準  $y^*$ 」; (10%)

2. 符合黃金率的每人資本量 (golden rule level of capital)  $k^g$ ; (10%)

3. 符合黃金率的最適儲蓄率  $s^g$ , 並說明其政策意涵。(10%)

說明資料:

$\delta$  = 資本折舊率 = 8%,  $n$  = 人口成長率 = 2%,  $s$  = 儲蓄率 = 20%,

$Y$  = 實質產出,  $K$  = 總資本量,  $L$  = 總勞動量 (= 總人口),

$y = Y/L$  = 每人產出,  $k = K/L$  = 每人資本,

\* = 長期均衡狀態,  $g$  = 符合黃金率的狀態,

$7.5^4 \approx 3164$ ,  $7.5^{1/4} \approx 1.65$ ,

生產函數:  $Y = L^{1/4}K^{3/4}$ 。

# 國立中山大學 95 學年度碩士班招生考試試題

科目：個體經濟學【經濟所碩士班】

共 2 頁 第 1 頁

10 questions, each with 10 points

1. Calculate the price and cross-price elasticities of demand for rice.

The rice demand function is

$$Q = c_0 - \alpha \cdot P_r + \beta \cdot P_s + \gamma \cdot Y,$$

where  $Q$  is the quantity of rice demanded per year,  $P_r$  is the price of rice,  $P_s$  is the price of the major substitute for rice,  $Y$  is the income of consumers, and  $c_0, \alpha, \beta, \gamma$  are all positive constants. Assume  $P_r$  is initially 25,  $P_s$  is 40, and  $Q$  is 1200.

2. A firm's average cost is  $AC = \alpha \cdot q^\beta$ , where  $\alpha > 0$ . How can you interpret  $\alpha$ ? What sign must  $\beta$  have if there is learning by doing? What happens to average cost as  $q$  gets large?
3. Can a firm be a natural monopoly if it has a U-shaped average cost curve? Why or why not?
4. In harmonizing its patent laws, the European Community outlawed exportation of certain chemicals used in 85% of U.S. generic drugs. This prohibition may delay the entry of generics onto the U.S. market by two to three years, a circumstance favoring U.S. patent holders, who already have enough chemicals to produce their own generics. What is the likely effect of this law on drug prices in the United States?
5. Suppose that identical duopoly firms have constant marginal costs of \$10 per unit. The demand function that each firm faces is

$$q_i = 100 - 2p_i + p_j, \quad i, j = 1 \text{ or } 2, \text{ and } i \neq j.$$

- i) Solve for the Bertrand equilibrium;
- ii) Solve for the Bertrand equilibrium if both firms have a marginal cost of \$0 per unit.

6. To discourage people from breaking the traffic laws, society can increase the probability that someone exceeding the speed limit will be caught and punished, or it can increase the size of the fine for speeding. Explain why either method can be used to discourage speeding. Which approach is a government likely to prefer, and why?

7. What is the mixed-strategy Nash equilibrium for the game below?

		Player 2	
		L	R
Player 1	U	2, 0	3, 2
	D	-1, 9	5, 7

8. There are many buyers who value high-quality used cars at the full-information price of  $p_1$  and lemons at  $p_2$ . There are a limited number of potential sellers who value high-quality cars at  $v_1 \leq p_1$  and lemons at  $v_2 \leq p_2$ . Everyone is risk neutral. The share of lemons among all the used cars that might potentially be sold is  $\theta$ . Under what conditions are all cars sold? When are only lemons sold? Are there any conditions under which no cars are sold?

9. What is the Coase theorem?

10. Give an example to explain the Coase theorem in detail.

Answer the following five questions, equally weighted

1.(20%)

Suppose that a random variable  $X$  has a uniform distribution on the interval  $(0, 1)$ . Determine the *p.d.f.* of (a)  $X^2$  and (b)  $X^{1/2}$ .

2.(20%)

Suppose that  $X$  and  $Y$  have a continuous joint distribution for which the joint *p.d.f.* is as follows:

$$f(x, y) = \begin{cases} x + y & \text{for } 0 \leq x \leq 1 \text{ and } 0 \leq y \leq 1, \\ 0 & \text{otherwise.} \end{cases}$$

Find  $E(Y|X)$  and  $Var(Y|X)$ .

3.(20%)

Suppose that  $X_1, \dots, X_n$  form a random sample from a distribution for which the *p.d.f.*  $f(x; \theta)$  is as follows:

$$f(x; \theta) = \begin{cases} \theta x^{\theta-1} & \text{for } 0 < x < 1, \\ 0 & \text{otherwise.} \end{cases}$$

Also, suppose that the value of  $\theta$  is unknown ( $\theta > 0$ ). Find M.L.E. (maximum likelihood estimator) of  $\theta$ .

4.(20%)

Suppose that a random variable  $X$  has a Poisson distribution for which the mean  $\theta$  is unknown ( $\theta > 0$ ). Find the Fisher information  $I(\theta)$  in  $X$ .

5.(20%)

Suppose that a random sample of 8 observations  $X_1, \dots, X_8$  is taken from a normal distribution for which both the mean  $\mu$  and the variance  $\sigma^2$  are unknown; and that is desired to test the following hypotheses:  $H_0 : \mu = 0$ ;  $H_1 : \mu \neq 0$ . Suppose also that the sample data are such that  $\sum_{i=1}^8 X_i = -11.2$  and  $\sum_{i=1}^8 X_i^2 = 43.7$ . If a nonsymmetric test is performed and that the hypothesis  $H_0$  is to be rejected if the statistic  $U$  is such that  $U < c_1$  or  $U > c_2$ , where  $\Pr(U < c_1) = 0.01$  and  $\Pr(U > c_2) = 0.10$ . Should  $H_0$  be accepted or rejected? Why?

APPENDIX G

STATISTICAL TABLES

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0	.5000	.5040	.5080	.5120	.5160	.5199	.5239	.5279	.5319	.5359
1	.5398	.5438	.5478	.5517	.5557	.5596	.5636	.5675	.5714	.5753
2	.5791	.5832	.5871	.5910	.5948	.5987	.6026	.6064	.6103	.6141
3	.6179	.6217	.6255	.6293	.6331	.6368	.6406	.6443	.6480	.6517
4	.6554	.6591	.6628	.6664	.6700	.6736	.6772	.6808	.6844	.6879
5	.6915	.6950	.6985	.7019	.7054	.7088	.7123	.7157	.7190	.7224
6	.7257	.7291	.7324	.7357	.7389	.7422	.7454	.7486	.7517	.7549
7	.7580	.7611	.7642	.7673	.7704	.7734	.7764	.7794	.7823	.7852
8	.7881	.7910	.7939	.7967	.7995	.8023	.8051	.8078	.8106	.8133
9	.8159	.8186	.8212	.8238	.8264	.8289	.8315	.8340	.8365	.8389
10	.8413	.8438	.8461	.8485	.8508	.8531	.8554	.8577	.8599	.8621
11	.8643	.8665	.8686	.8708	.8729	.8749	.8770	.8790	.8810	.8830
12	.8849	.8869	.8888	.8907	.8925	.8944	.8962	.8980	.8997	.9015
13	.9032	.9049	.9066	.9082	.9099	.9115	.9131	.9147	.9162	.9177
14	.9192	.9207	.9222	.9236	.9251	.9265	.9279	.9292	.9306	.9319
15	.9332	.9345	.9357	.9370	.9382	.9394	.9406	.9418	.9429	.9441
16	.9452	.9463	.9474	.9484	.9495	.9505	.9515	.9525	.9535	.9545
17	.9554	.9564	.9573	.9582	.9591	.9600	.9608	.9616	.9625	.9633
18	.9641	.9649	.9656	.9664	.9671	.9678	.9686	.9693	.9699	.9705
19	.9713	.9719	.9726	.9732	.9738	.9744	.9750	.9756	.9761	.9767
20	.9772	.9778	.9783	.9788	.9793	.9798	.9803	.9808	.9812	.9817
21	.9821	.9826	.9830	.9834	.9838	.9842	.9846	.9850	.9854	.9857
22	.9861	.9864	.9868	.9871	.9875	.9878	.9881	.9884	.9887	.9890
23	.9893	.9896	.9898	.9901	.9904	.9906	.9909	.9911	.9913	.9916
24	.9918	.9920	.9922	.9925	.9927	.9929	.9931	.9932	.9934	.9936
25	.9938	.9940	.9941	.9943	.9945	.9946	.9948	.9949	.9951	.9952
26	.9953	.9955	.9957	.9959	.9960	.9961	.9962	.9963	.9964	.9966
27	.9965	.9966	.9967	.9968	.9969	.9970	.9971	.9972	.9973	.9974
28	.9974	.9975	.9976	.9977	.9977	.9978	.9979	.9979	.9980	.9981
29	.9981	.9982	.9982	.9983	.9984	.9984	.9985	.9985	.9986	.9986
30	.9987	.9987	.9988	.9988	.9988	.9989	.9989	.9989	.9990	.9990
31	.9991	.9991	.9991	.9991	.9992	.9992	.9992	.9992	.9993	.9993
32	.9993	.9993	.9993	.9994	.9994	.9994	.9994	.9995	.9995	.9995
33	.9995	.9995	.9995	.9996	.9996	.9996	.9996	.9997	.9997	.9997
34	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9998	.9998

954 APPENDIX G Statistical Tables

n	.750	.900	.950	.975	.990	.995
1	1.000	3.078	6.314	12.706	31.821	63.657
2	.816	1.886	2.920	4.303	6.965	9.925
3	.765	1.638	2.353	3.182	4.541	5.841
4	.741	1.533	2.132	2.776	3.747	4.604
5	.727	1.476	2.015	2.571	3.365	4.032
6	.718	1.440	1.943	2.447	3.143	3.707
7	.711	1.415	1.895	2.365	2.998	3.499
8	.706	1.397	1.860	2.306	2.896	3.355
9	.703	1.383	1.835	2.262	2.821	3.250
10	.700	1.372	1.812	2.228	2.764	3.169
11	.697	1.363	1.796	2.201	2.718	3.106
12	.695	1.356	1.782	2.179	2.681	3.055
13	.694	1.350	1.771	2.160	2.650	3.012
14	.692	1.345	1.761	2.145	2.624	2.977
15	.691	1.341	1.753	2.131	2.602	2.947
16	.690	1.337	1.746	2.119	2.583	2.921
17	.689	1.333	1.740	2.110	2.567	2.898
18	.688	1.328	1.734	2.101	2.552	2.878
19	.688	1.325	1.729	2.093	2.539	2.861
20	.687	1.322	1.725	2.086	2.528	2.845
21	.686	1.320	1.721	2.080	2.518	2.831
22	.686	1.318	1.717	2.074	2.509	2.819
23	.685	1.316	1.714	2.069	2.500	2.807
24	.685	1.315	1.711	2.064	2.492	2.797
25	.684	1.314	1.708	2.056	2.485	2.787
26	.684	1.313	1.706	2.052	2.479	2.779
27	.683	1.312	1.704	2.048	2.473	2.771
28	.683	1.311	1.703	2.045	2.467	2.765
29	.683	1.311	1.701	2.042	2.462	2.759
30	.683	1.310	1.699	2.040	2.457	2.754
35	.681	1.306	1.694	2.030	2.438	2.724
40	.680	1.303	1.684	2.021	2.423	2.704
45	.679	1.301	1.679	2.014	2.409	2.690
50	.679	1.299	1.671	2.009	2.403	2.678
60	.678	1.296	1.667	2.000	2.390	2.660
70	.678	1.294	1.662	1.994	2.381	2.648
80	.678	1.292	1.662	1.990	2.374	2.639
90	.677	1.291	1.662	1.987	2.368	2.632
100	.677	1.290	1.660	1.984	2.364	2.626
∞	.674	1.282	1.645	1.960	2.326	2.576