Multiple Choice (1 point each)

Identify the letter of the choice that best completes the statement or answers the question.

1. Mike and Sandy are two woodworkers who both make tables and chairs. In one month, Mike can make 4 tables or 20 chairs, while Sandy can make 6 tables or 18 chairs. Given this, we know that

   A. Mike has an absolute advantage in chairs.
   B. Mike has a comparative advantage in tables.
   C. Sandy has an absolute advantage in chairs.
   D. Sandy has a comparative advantage in chairs.

2. New oak tables are normal goods. What would happen to the equilibrium price and quantity in the market for oak tables if the price of maple tables rises and the price of wood saws increased?

   A. Price will fall and the effect on quantity is ambiguous.
   B. Price will rise and the effect on quantity is ambiguous.
   C. Quantity will fall and the effect on price is ambiguous.
   D. Quantity will rise and the effect on price is ambiguous.

3. When a good is taxed, the burden of the tax

   A. falls more heavily on the side of the market that is more elastic.
   B. falls more heavily on the side of the market that is more inelastic.
   C. falls more heavily on the side of the market that is closer to unit elastic.
   D. is distributed independently of relative elasticities of supply and demand.

4. An optimal tax on pollution would result in which of the following?

   A. Producers will choose not to produce any pollution.
   B. Producers will internalize the cost of pollution.
   C. Producers will maximize production.
   D. The value to consumers at market equilibrium will exceed the social cost of production.

5. Which of the following is not a characteristic of pollution permits?

   A. Prices are set by supply and demand.
   B. Allowing firms to trade their permits reduces the total quantity of pollution beyond the initial allocation.
   C. Real-world markets for pollution permits include sulfur dioxide and carbon.

D. Firms for whom pollution reduction is very expensive are willing to pay more for permits than firms for whom pollution reduction is less expensive.

6. The marginal product of labor is equal to the
   A. increase in labor necessary to generate a one unit increase in output.
   B. increase in output obtained from a one unit increase in labor.
   C. incremental profit associated with a one unit increase in labor.
   D. incremental cost associated with a one unit increase in labor.

7. When marginal revenue equals marginal cost,
   A. the firm must be generating economic profits.
   B. the profit maximizing firm should always increase its level of production.
   C. the firm must be generating economic losses.
   D. losses are minimized even if the firm is not making a profit.

8. Which of the following statements is true of monopolies?
   A. Monopolies can charge any price they want.
   B. Unlike competitive firms, monopolies are not constrained by market demand.
   C. Monopolies will always increase their revenue by selling more of their goods.
   D. All of the above are correct.

9. Because each oligopolist cares about its own profit rather than the collective profit of all the oligopolists together,
   A. society is worse off.
   B. they are able to maximize their individual profits.
   C. they are unable to maintain monopoly power.
   D. All of the above are correct.

10. If firms in a monopolistically competitive market are earning economic profits, which of the following scenarios would best reflect the change facing incumbent firms as the market adjusts to its new equilibrium?
    A. a downward shift in their marginal cost curve
    B. an upward shift in their marginal cost curve
    C. an increase in demand
    D. a decrease in demand

| 備　　　註 | 一、作答於試題上者，不予計分。
二、試題請隨卷繳交。 |

11. The menu cost of inflation arises since

A. people hold less currency if inflation is positive and thus they take more trips to the bank.

B. the central bank eventually has to restrict money supply and this causes an increase in the unemployment rate.

C. real wages and real money holdings lose purchasing power.

D. resources have to be devoted to marking up prices and changing vending machines and cash registers.

12. In the medium run, if government purchases are increased and nominal money supply is decreased, we can expect that

A. aggregate demand and prices will increase but interest rates will not change.

B. aggregate demand, prices, and the interest rate will all decrease.

C. aggregate demand and interest rates will decrease but prices will increase.

D. the interest rate will increase while aggregate demand and prices may increase, decrease, or remain the same.

13. Assume you would like to stimulate investment but leave the level of GDP roughly the same. What policy mix would you propose?

A. an income tax cut combined with monetary expansion

B. a tax cut combined with monetary restriction

C. a cut in government spending combined with monetary expansion

D. a cut in government spending combined with monetary restriction

14. Given a normal IS-LM model, which of the following is FALSE?

A. Expansionary monetary policy will increase the level of investment and consumption.

B. Lower income taxes will raise the level of consumption but lower the level of investment.

C. A cut in government transfer payments will reduce consumption and interest rates.

D. An investment subsidy will increase the level of investment but not the level of consumption.

15. If we compare a closed economy to an open economy under a flexible exchange rate system, we can see that fiscal policy is always

A. more effective because of positive repercussion effects.

B. more effective because the marginal propensity to import is positive.

C. less effective because part of the increase in domestic income is spent on foreign goods.

備　註　一、作答於試題上者，不予計分。
二、試題請隨卷繳交。

考 試 科 目 經濟學 系所別 商學院其同科 考試時間 2月18日(六) 第一節

D. less effective because expansionary fiscal policy always has to be supplemented by restrictive monetary policy.

16. If the government increases expenditures on goods and services and increases taxation by the same amount, which of the following will occur?

   A. Aggregate demand will be unchanged.

   B. Aggregate demand will increase.

   C. The money supply will decrease.

   D. The money supply will increase.

17. To counteract a recession, the central bank should

   A. sell securities on the open market and raise the discount rate.

   B. sell securities on the open market and lower the discount rate.

   C. buy securities on the open market and raise the discount rate.

   D. buy securities on the open market and lower the discount rate.

18. If the reserve requirement is 25 percent and banks hold no excess reserves, an open market sale of $400,000 of government securities by the central bank will

   A. increase the money supply by up to $1.6 million.

   B. decrease the money supply by up to $1.6 million.

   C. increase the money supply by up to $400,000.

   D. decrease the money supply by up to $400,000.

19. If nominal gross domestic product fell while real gross domestic product rose, which of the following must be true?

   A. Unemployment increased.

   B. The inflation rate was negative.

   C. Net exports were negative.

   D. The average of stock prices rose while bond prices fell.

20. The purchase of bonds by the central bank will have the greatest effect on real gross domestic product if which of the following situations exists in the economy?

   A. The required reserve ratio is high, and the interest rate has a large effect on investment spending.

備 註 一、作答於試題上者，不予計分。
二、試題請隨卷繳交。

B. The required reserve ratio is high, and the interest rate has a small effect on investment spending.

C. The required reserve ratio is low, and the interest rate has a large effect on investment spending.

D. The required reserve ratio is low, and the marginal propensity to consume is low.

Problems and Short-essay Questions

Please answer the following questions IN SEQUENCE. All questions may be answered in either Chinese or English.

1. Consider an individual who has I dollars to allocate between good x and good y and whose preference is represented by the quasi-linear utility function $U(x, y) = \ln x + y$. Let p_x and p_y denote, respectively, the prices of good x and good y.

    A. (6 points) Calculate the Marshallian demand functions for good x and good y.

    B. (6 points) Suppose that $p_x = 1$, $p_y = 2$, and $I = 8$. Calculate the income elasticity of demand for each good.

    C. (4 points) Now suppose the government levies a 1 dollar per unit tax on good x such that the price of good x increases to $p_x = 2$ while the price of good y and income remain unchanged at $p_y = 2$ and $I = 8$. Calculate the tax revenue and the indirect utility.

    D. (4 points) Suppose instead of taxing the consumption of good x, an income tax that collects the same amount of tax revenue as in part (C) is imposed. Calculate the indirect utility.

2. In a monopolistically competitive market, a firm faces the following demand function:

$$q = \frac{P^{-\sigma}}{N},$$

where q is the quantity demanded, P is the price, $\sigma > 1$ is a constant, N is the number of producers. The total cost of production is $f + cq$, where f and c are both positive and constants.

    A. (10 points) Derive the optimal price charged by the firm.

    B. (10 points) Calculate the number of producers at equilibrium.

備 註 一、作答於試題上者，不予計分。
二、試題請隨卷繳交。

考 試 科 目	經濟學	系 所 別	商學院碩士	考試時間	二月18日(六) 第一節

3. Consider an economy in which production is characterized by the neoclassical function $Y = K^{0.5}N^{0.5}$, where Y, K and N denote the output, capital stock and quantity of labor, respectively. Suppose that it has a saving rate of 0.1, a population growth rate of 0.02, and an average depreciation rate of 0.03.

A. (5 points) Write this production function in per capita form in which $y = Y/N$ and $k = K/N$, and find the steady-state value of y and k.

B. (5 points) At the steady-state value of k, is there more or less capital than at the golden-rule level?

C. (5 points) Determine what saving rate would yield the golden-rule level of capital in this model.

D. (5 points) In the context of this neoclassical growth model, can a country have *too much* saving?

4. Answer the following two questions:

A. With a consumption function $C = 100 + 0.8Y_d$ (Y_d, the disposable income, is defined as income after taxes: $Y_d = Y - T$), investment $I = 200$, government expenditure $G = 100$, transfer payment $TR = 62.5$, tax revenue $T = 0.25Y$, compute

   a. (4 points) the equilibrium national income;

   b. (4 points) the balanced budget multiplier for this economy.

B. For a country with the following macroeconomic statistics: national income=5000; disposable income=4000; government budget deficit=200; consumption=3500; and trade deficit=100, compute levels of

   a. (4 points) saving;

   b. (4 points) investment;

   c. (4 points) government expenditure for this country.

備　　　註	一、作答於試題上者，不予計分。 二、試題請隨卷繳交。

| 考 試 科 目 | 財務管理 | 系所別 | 金融系金融管理組 | 考試時間 | 2月18日(六)第二節 |

4213

一、 繪圖說明個別投資人如何決定自己的最佳投資組合。(15分)

二、 (1)宏圖公司預期下期的每股盈餘為 5 元,盈餘保留率為 40%,股東權益報酬率為 20%,股東要求的必要報酬率是 12%,請問宏圖公司股票的成長價值是多少?(10分)

(2)以宏圖公司為例,說明在何情況下,其股票會由成長股變成收益股?(5分)

三、 說明一項投資計畫的淨現值大於零的經濟意義,並列舉五種淨現值的可能來源。(10分)

四、 (1)捷安機車廠正在評估是否投資生產『風神』機車。每輛機車售價是 4 萬元,變動成本為每輛 2 萬元,固定成本(不含折舊費用)每年是 500 萬元。這個投資案的投資額為 3,500 萬元,將在五年內以直線法攤提折舊費用。根據市場調查顯示,5 年期間可以銷售 4,250 輛機車,平均每年 850 輛,本投資案的必要報酬率為 20%,在不考慮稅的情況下,試求淨現值兩平點的銷售量。(10分) PVIFA(20%,5)=2.9906

(2)若投資規模由原案調改為 1,870 萬元,變動成本增加為每輛 2.5 萬元,試求(a)調改案的淨現值兩平點銷售量。(5分) (b)原案與調改案的淨現值無差異分析。(10分)

(3)請建議應以原案或以調改案進行投資,並說明理由。(5分)

五、 某公司部分損益表數字如下:(單位為萬元)營業收入 5,000,變動成本為營收的 20%,固定成本為 3,500,利息費用為 400,稅率為 50%,流通股數為 10 萬股,試求:

(1) 該公司的營運槓桿度、財務槓桿度、及總槓桿度。(10分)

(2) 因產業特性之故,成本結構不易變動,請問對該公司之資本結構有何建議?(5分)

六、 請解釋下列實質選擇權的意義並舉例說明適用於何種產業。(15分)

(1) Option to defer

(2) Time to build option

(3) Option to alter operation scale

(4) Option to switch

(5) Growth option (每小題 3 分)

| 備 註 | 一、作答於試題上者,不予計分。
二、試題請隨卷繳交。 |

考 試 科 目	統計學A 4121l	系 所 別	金融系金融管理組	考 試 時 間	2月18日(六) 第三節

1. **(30%)** An insurance agent likes to sell two types of policies to his clients, selling them both life insurance and auto insurance. The following joint distribution summarizes the properties of the number of life insurance policies sold to an individual (X) and the number of auto policies (Y).

		X	
		0	**1 life policy**
Y	**0**	0.10	0.25
	1 auto policy	0.25	0.40

   (1) Find the expected value and variance of the number of life insurance policies. **(6%)**

   (2) Find the expected value and variance of the number of auto insurance policies. **(6%)**

   (3) Find the correlation between X and Y. **(10%)**

   (4) The agent earns TWD7,500 from selling a life insurance policy and TWD4000 from selling an auto policy. What is the expected value and standard deviation of the earnings of this agent from policies sold to a client? **(8%)**

2. **(20%)** A toll-free phone number is available from 9 A.M to 9 P.M. for your customers to register complaints about a product purchased from your company. Past history indicates that an average of 0.8 calls is received per minute.

   (1) What properties must be true about the situation described here in order to use the Poisson distribution to calculate probabilities concerning the number of phone calls received in a one-minute period? **(6%)**

   (2) What is the probability that during a one-minute period two or more phone calls will be received? **(6%)**

   (3) What is the maximum number of phone calls that will be received in a one-minute period 99.99% of the time? **(8%)**

3. **(25%)** The following table summarizes whether the stock market went up or down during each trading day of a particular year.

		Day of week				
		Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**
Market	**Down**	42	49	46	43	41
Direction	**Up**	53	55	58	59	58

   Use the significance level 0.05 to answer the following questions.

   (1) Test whether the proportion of earning positive return for each day, the overall rate of this particular year, is 0.5. **(7%)**

備 註	一、作答於試題上者，不予計分。 二、試題請隨卷繳交。

考 試 科 目	統計學 A	系 所 別	金融系金融管理組	考 試 時 間	2月 18日(六) 第三節

(2) Test whether the probabilities of earning positive return are equal when trading on Monday and Tuesday. (8%)

(3) Use a chi-squared test to determine if these data indicate that trading on some days is better or worse (more or less likely to earn positive returns) than any other. (10%)

4. **(25%)** The following table summarizes the playing time (in seconds) of a sample of 639 songs grouped by genre.

Genre	Blues	Country	Folk	Jazz	Latin	Rock
Mean	261.68	205.36	187.68	300.08	262.27	234.33
Standard deviation	84.57	68.23	67.68	122.69	83.37	103.30
Number of songs	19	96	63	192	22	247

(1) Test whether the population means of playing time for folk and country genres are equal with the significance level 0.05. (8%)

(2) Fit a multiple regression of rating on five dummy variables that represents the blues, country, folk, jazz, and Latin genres. The following table summarizes the estimated results. Fill in all the empty cells (a)-(l). (12%)

Term	Estimate	Standard error	t statistic
Intercept	(a)	6.448	(g)
Blues	(b)	24.127	(h)
Country	(c)	12.188	(i)
Folk	(d)	14.304	(j)
Jazz	(e)	9.750	(k)
Latin	(f)	22.548	(l)

(3) Compute the value of R^2 for the regression model in part (2). (5%)

備 註	一、作答於試題上者，不予計分。 二、試題請隨卷繳交。

考 試 科 目 統計學A　系 所 別 金融系金融管理組　考試時間 2月18日(六) 第三 節

Table of the standard normal distribution

Z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.5000	0.5040	0.5080	0.5120	0.5160	0.5199	0.5239	0.5279	0.5319	0.5359
0.1	0.5398	0.5438	0.5478	0.5517	0.5557	0.5596	0.5636	0.5675	0.5714	0.5753
0.2	0.5793	0.5832	0.5871	0.5910	0.5948	0.5987	0.6026	0.6064	0.6103	0.6141
0.3	0.6179	0.6217	0.6255	0.6293	0.6331	0.6368	0.6406	0.6443	0.6480	0.6517
0.4	0.6554	0.6591	0.6628	0.6664	0.6700	0.6736	0.6772	0.6808	0.6844	0.6879
0.5	0.6915	0.6950	0.6985	0.7019	0.7054	0.7088	0.7123	0.7157	0.7190	0.7224
0.6	0.7257	0.7291	0.7324	0.7357	0.7389	0.7422	0.7454	0.7486	0.7517	0.7549
0.7	0.7580	0.7611	0.7642	0.7673	0.7704	0.7734	0.7764	0.7794	0.7823	0.7852
0.8	0.7881	0.7910	0.7939	0.7967	0.7995	0.8023	0.8051	0.8078	0.8106	0.8133
0.9	0.8159	0.8186	0.8212	0.8238	0.8264	0.8289	0.8315	0.8340	0.8365	0.8389
1.0	0.8413	0.8438	0.8461	0.8485	0.8508	0.8531	0.8554	0.8577	0.8599	0.8621
1.1	0.8643	0.8665	0.8686	0.8708	0.8729	0.8749	0.8770	0.8790	0.8810	0.8830
1.2	0.8849	0.8869	0.8888	0.8907	0.8925	0.8944	0.8962	0.8980	0.8997	0.9015
1.3	0.9032	0.9049	0.9066	0.9082	0.9099	0.9115	0.9031	0.9147	0.9162	0.9177
1.4	0.9192	0.9207	0.9222	0.9236	0.9251	0.9265	0.9279	0.9292	0.9306	0.9319
1.5	0.9332	0.9345	0.9357	0.9370	0.9382	0.9394	0.9406	0.9418	0.9429	0.9441
1.6	0.9452	0.9463	0.9474	0.9484	0.9495	0.9505	0.9515	0.9525	0.9535	0.9545
1.7	0.9554	0.9564	0.9573	0.9582	0.9591	0.9599	0.9608	0.9616	0.9625	0.9633
1.8	0.9641	0.9649	0.9656	0.9664	0.9671	0.9678	0.9686	0.9693	0.9699	0.9706
1.9	0.9713	0.9719	0.9726	0.9732	0.9738	0.9744	0.9750	0.9756	0.9761	0.9767
2.0	0.9772	0.9778	0.9783	0.9788	0.9793	0.9798	0.9803	0.9808	0.9812	0.9817
2.1	0.9821	0.9826	0.9830	0.9834	0.9838	0.9842	0.9846	0.9850	0.9854	0.9857
2.2	0.9861	0.9864	0.9868	0.9871	0.9875	0.9878	0.9881	0.9884	0.9887	0.9890
2.3	0.9893	0.9896	0.9898	0.9901	0.9904	0.9906	0.9909	0.9911	0.9913	0.9916
2.4	0.9918	0.9920	0.9922	0.9924	0.9927	0.9929	0.9931	0.9932	0.9934	0.9936
2.5	0.9938	0.9940	0.9941	0.9943	0.9945	0.9946	0.9948	0.9949	0.9951	0.9952
2.6	0.9953	0.9955	0.9956	0.9957	0.9958	0.9960	0.9961	0.9962	0.9963	0.9964
2.7	0.9965	0.9966	0.9967	0.9968	0.9969	0.9970	0.9971	0.9972	0.9973	0.9974
2.8	0.9974	0.9975	0.9976	0.9977	0.9977	0.9978	0.9979	0.9979	0.9980	0.9981
2.9	0.9981	0.9982	0.9982	0.9983	0.9984	0.9984	0.9985	0.9985	0.9986	0.9986

備　　　註
一、作答於試題上者，不予計分。
二、試題請隨卷繳交。

| 考 試 科 目 | 統計學A | 系 所 別 | 金融投資金融管理組 | 考試時間 | 二月 18 日(六) 第三 節 |

Table of the Chi-square Distribution
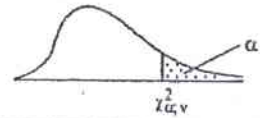
α =	0.995	0.99	0.98	0.975	0.95	0.90	0.80	0.20	0.10	0.05	0.025	0.02	0.01	0.005	0.001	= α
v = 1	0.0000393	0.000157	0.000628	0.000982	0.00393	0.0158	0.0642	1.642	2.706	3.841	5.024	5.412	6.635	7.879	10.827	v = 1
2	0.0100	0.0201	0.0404	0.0506	0.103	0.211	0.446	3.219	4.605	5.991	7.378	7.824	9.210	10.597	13.815	2
3	0.0717	0.115	0.185	0.216	0.352	0.584	1.005	4.642	6.251	7.815	9.348	9.837	11.345	12.836	16.268	3
4	0.207	0.297	0.429	0.484	0.711	1.064	1.649	5.989	7.779	9.488	11.143	11.668	13.277	14.860	18.465	4
5	0.412	0.554	0.752	0.831	1.145	1.610	2.343	7.289	9.236	11.070	12.832	13.388	15.086	16.750	20.517	5
6	0.676	0.872	1.134	1.237	1.635	2.204	3.070	8.558	10.645	12.592	14.449	15.033	16.812	18.548	22.457	6
7	0.989	1.239	1.564	1.690	2.167	2.833	3.822	9.803	12.017	14.067	16.013	16.622	18.475	20.278	24.322	7
8	1.344	1.646	2.032	2.180	2.733	3.490	4.594	11.030	13.362	15.507	17.535	18.168	20.090	21.955	26.125	8
9	1.735	2.088	2.532	2.700	3.325	4.168	5.380	12.242	14.684	16.919	19.023	19.679	21.666	23.589	27.877	9
10	2.156	2.558	3.059	3.247	3.940	4.865	6.179	13.442	15.987	18.307	20.483	21.161	23.209	25.188	29.588	10
11	2.603	3.053	3.609	3.816	4.575	5.578	6.989	14.631	17.275	19.675	21.920	22.618	24.725	26.757	31.264	11
12	3.074	3.571	4.178	4.404	5.226	6.304	7.807	15.812	18.549	21.026	23.337	24.054	26.217	28.300	32.909	12
13	3.565	4.107	4.765	5.009	5.892	7.042	8.634	16.985	19.812	22.362	24.736	25.472	27.688	29.819	34.528	13
14	4.075	4.660	5.368	5.629	6.571	7.790	9.467	18.151	21.064	23.685	26.119	26.873	29.141	31.319	36.123	14
15	4.601	5.229	5.985	6.262	7.261	8.547	10.307	19.311	22.307	24.996	27.488	28.259	30.578	32.801	37.697	15
16	5.142	5.812	6.614	6.908	7.962	9.312	11.152	20.465	23.542	26.296	28.845	29.633	32.000	34.267	39.252	16
17	5.697	6.408	7.255	7.564	8.672	12.002	12.002	21.615	24.769	27.587	30.191	30.995	33.409	35.718	40.790	17
18	6.265	7.015	7.906	8.231	9.390	10.865	12.857	22.760	25.989	28.869	31.526	32.346	34.805	37.156	42.312	18
19	6.844	7.633	8.567	8.907	10.117	11.651	13.716	23.900	27.204	30.144	32.852	33.687	36.191	38.582	43.820	19
20	7.434	8.260	9.237	9.591	10.851	12.443	14.578	25.038	28.412	31.410	34.170	35.020	37.566	39.997	45.315	20
21	8.034	8.897	9.915	10.283	11.591	13.240	15.445	26.171	29.615	32.671	35.479	36.343	38.932	41.401	46.797	21
22	8.643	9.542	10.600	10.982	12.338	14.041	16.314	27.301	30.813	33.924	36.781	37.659	40.289	42.796	48.268	22
23	9.260	10.196	11.293	11.688	13.091	14.848	17.187	28.429	32.007	35.172	38.076	38.968	41.638	44.181	49.728	23
24	9.886	10.856	11.992	12.401	13.848	15.659	18.062	29.553	33.196	36.415	39.364	40.270	42.980	45.558	51.179	24
25	10.520	11.524	12.697	13.120	14.611	16.473	18.940	30.675	34.382	37.652	40.646	41.566	44.314	46.928	52.620	25
26	11.160	12.198	13.409	13.844	15.379	17.292	19.820	31.795	35.563	38.885	41.923	42.856	45.642	48.290	54.052	26
27	11.808	12.879	14.125	14.573	16.151	18.114	20.703	32.912	36.741	40.113	43.194	44.140	46.963	49.645	55.476	27
28	12.461	13.565	14.847	15.308	16.928	18.939	21.588	34.027	37.916	41.337	44.461	45.419	48.278	50.993	56.893	28
29	13.121	14.256	15.574	16.047	17.708	19.768	22.475	35.139	39.087	42.557	45.722	46.693	49.588	52.336	58.302	29
30	13.787	14.953	16.306	16.791	18.493	20.599	23.364	36.250	40.256	43.773	46.979	47.962	50.892	53.672	59.703	30
40	20.706	22.164	23.838	24.433	26.509	29.051	32.345	47.269	51.805	55.759	59.342	60.436	63.691	66.766	73.402	40
50	27.991	29.707	31.664	32.357	34.764	37.689	41.449	58.164	63.167	67.505	71.420	72.613	76.154	79.490	86.661	50
60	35.535	37.485	39.699	40.482	43.188	46.459	50.641	68.972	74.397	79.082	83.298	84.580	88.379	91.952	99.607	60
70	43.275	45.442	47.893	48.758	51.739	55.329	59.898	79.715	85.527	90.531	95.023	96.388	100.425	104.215	112.317	70
80	51.171	53.539	56.213	57.153	60.391	64.278	69.207	90.405	96.578	101.880	106.629	108.069	112.329	116.321	124.839	80
90	59.196	61.754	64.634	65.646	69.126	73.291	78.558	101.054	107.565	113.145	118.136	119.648	124.116	128.299	137.208	90
100	67.327	70.065	73.142	74.222	77.929	82.358	87.945	111.667	118.498	124.342	129.561	131.142	135.807	140.170	149.449	100

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Multiple Choice (1 point each)

Identify the letter of the choice that best completes the statement or answers the question.

1. Mike and Sandy are two woodworkers who both make tables and chairs. In one month, Mike can make 4 tables or 20 chairs, while Sandy can make 6 tables or 18 chairs. Given this, we know that
   A. Mike has an absolute advantage in chairs.
   B. Mike has a comparative advantage in tables.
   C. Sandy has an absolute advantage in chairs.
   D. Sandy has a comparative advantage in chairs.

2. New oak tables are normal goods. What would happen to the equilibrium price and quantity in the market for oak tables if the price of maple tables rises and the price of wood saws increased?
   A. Price will fall and the effect on quantity is ambiguous.
   B. Price will rise and the effect on quantity is ambiguous.
   C. Quantity will fall and the effect on price is ambiguous.
   D. Quantity will rise and the effect on price is ambiguous.

3. When a good is taxed, the burden of the tax
   A. falls more heavily on the side of the market that is more elastic.
   B. falls more heavily on the side of the market that is more inelastic.
   C. falls more heavily on the side of the market that is closer to unit elastic.
   D. is distributed independently of relative elasticities of supply and demand.

4. An optimal tax on pollution would result in which of the following?
   A. Producers will choose not to produce any pollution.
   B. Producers will internalize the cost of pollution.
   C. Producers will maximize production.
   D. The value to consumers at market equilibrium will exceed the social cost of production.

5. Which of the following is not a characteristic of pollution permits?
   A. Prices are set by supply and demand.
   B. Allowing firms to trade their permits reduces the total quantity of pollution beyond the initial allocation.
   C. Real-world markets for pollution permits include sulfur dioxide and carbon.

備　　　註	一、作答於試題上者，不予計分。 二、試題請隨卷繳交。

D. Firms for whom pollution reduction is very expensive are willing to pay more for permits than firms for whom pollution reduction is less expensive.

6. The marginal product of labor is equal to the

   A. increase in labor necessary to generate a one unit increase in output.

   B. increase in output obtained from a one unit increase in labor.

   C. incremental profit associated with a one unit increase in labor.

   D. incremental cost associated with a one unit increase in labor.

7. When marginal revenue equals marginal cost,

   A. the firm must be generating economic profits.

   B. the profit maximizing firm should always increase its level of production.

   C. the firm must be generating economic losses.

   D. losses are minimized even if the firm is not making a profit.

8. Which of the following statements is true of monopolies?

   A. Monopolies can charge any price they want.

   B. Unlike competitive firms, monopolies are not constrained by market demand.

   C. Monopolies will always increase their revenue by selling more of their goods.

   D. All of the above are correct.

9. Because each oligopolist cares about its own profit rather than the collective profit of all the oligopolists together,

   A. society is worse off.

   B. they are able to maximize their individual profits.

   C. they are unable to maintain monopoly power.

   D. All of the above are correct.

10. If firms in a monopolistically competitive market are earning economic profits, which of the following scenarios would best reflect the change facing incumbent firms as the market adjusts to its new equilibrium?

   A. a downward shift in their marginal cost curve

   B. an upward shift in their marginal cost curve

   C. an increase in demand

   D. a decrease in demand

備　　　註	一、作答於試題上者，不予計分。 二、試題請隨卷繳交。

11. The menu cost of inflation arises since

    A. people hold less currency if inflation is positive and thus they take more trips to the bank.

    B. the central bank eventually has to restrict money supply and this causes an increase in the unemployment rate.

    C. real wages and real money holdings lose purchasing power.

    D. resources have to be devoted to marking up prices and changing vending machines and cash registers.

12. In the medium run, if government purchases are increased and nominal money supply is decreased, we can expect that

    A. aggregate demand and prices will increase but interest rates will not change.

    B. aggregate demand, prices, and the interest rate will all decrease.

    C. aggregate demand and interest rates will decrease but prices will increase.

    D. the interest rate will increase while aggregate demand and prices may increase, decrease, or remain the same.

13. Assume you would like to stimulate investment but leave the level of GDP roughly the same. What policy mix would you propose?

    A. an income tax cut combined with monetary expansion

    B. a tax cut combined with monetary restriction

    C. a cut in government spending combined with monetary expansion

    D. a cut in government spending combined with monetary restriction

14. Given a normal IS-LM model, which of the following is FALSE?

    A. Expansionary monetary policy will increase the level of investment and consumption.

    B. Lower income taxes will raise the level of consumption but lower the level of investment.

    C. A cut in government transfer payments will reduce consumption and interest rates.

    D. An investment subsidy will increase the level of investment but not the level of consumption.

15. If we compare a closed economy to an open economy under a flexible exchange rate system, we can see that fiscal policy is always

    A. more effective because of positive repercussion effects.

    B. more effective because the marginal propensity to import is positive.

    C. less effective because part of the increase in domestic income is spent on foreign goods.

D. less effective because expansionary fiscal policy always has to be supplemented by restrictive monetary policy.

16. If the government increases expenditures on goods and services and increases taxation by the same amount, which of the following will occur?

   A. Aggregate demand will be unchanged.

   B. Aggregate demand will increase.

   C. The money supply will decrease.

   D. The money supply will increase.

17. To counteract a recession, the central bank should

   A. sell securities on the open market and raise the discount rate.

   B. sell securities on the open market and lower the discount rate.

   C. buy securities on the open market and raise the discount rate.

   D. buy securities on the open market and lower the discount rate.

18. If the reserve requirement is 25 percent and banks hold no excess reserves, an open market sale of $400,000 of government securities by the central bank will

   A. increase the money supply by up to $1.6 million.

   B. decrease the money supply by up to $1.6 million.

   C. increase the money supply by up to $400,000.

   D. decrease the money supply by up to $400,000.

19. If nominal gross domestic product fell while real gross domestic product rose, which of the following must be true?

   A. Unemployment increased.

   B. The inflation rate was negative.

   C. Net exports were negative.

   D. The average of stock prices rose while bond prices fell.

20. The purchase of bonds by the central bank will have the greatest effect on real gross domestic product if which of the following situations exists in the economy?

   A. The required reserve ratio is high, and the interest rate has a large effect on investment spending.

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B. The required reserve ratio is high, and the interest rate has a small effect on investment spending.

C. The required reserve ratio is low, and the interest rate has a large effect on investment spending.

D. The required reserve ratio is low, and the marginal propensity to consume is low.

Problems and Short-essay Questions

Please answer the following questions IN SEQUENCE. All questions may be answered in either Chinese or English.

1. Consider an individual who has I dollars to allocate between good x and good y and whose preference is represented by the quasi-linear utility function $U(x, y) = \ln x + y$. Let p_x and p_y denote, respectively, the prices of good x and good y.

A. (6 points) Calculate the Marshallian demand functions for good x and good y.

B. (6 points) Suppose that $p_x = 1$, $p_y = 2$, and $I = 8$. Calculate the income elasticity of demand for each good.

C. (4 points) Now suppose the government levies a 1 dollar per unit tax on good x such that the price of good x increases to $p_x = 2$ while the price of good y and income remain unchanged at $p_y = 2$ and $I = 8$. Calculate the tax revenue and the indirect utility.

D. (4 points) Suppose instead of taxing the consumption of good x, an income tax that collects the same amount of tax revenue as in part (C) is imposed. Calculate the indirect utility.

2. In a monopolistically competitive market, a firm faces the following demand function:

$$q = \frac{P^{-\sigma}}{N},$$

where q is the quantity demanded, P is the price, $\sigma > 1$ is a constant, N is the number of producers. The total cost of production is $f + cq$, where f and c are both positive and constants.

A. (10 points) Derive the optimal price charged by the firm.

B. (10 points) Calculate the number of producers at equilibrium.

備　註　一、作答於試題上者，不予計分。
二、試題請隨卷繳交。

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3. Consider an economy in which production is characterized by the neoclassical function $Y = K^{0.5}N^{0.5}$, where Y, K and N denote the output, capital stock and quantity of labor, respectively. Suppose that it has a saving rate of 0.1, a population growth rate of 0.02, and an average depreciation rate of 0.03.

A. (5 points) Write this production function in per capita form in which $y = Y/N$ and $k = K/N$, and find the steady-state value of y and k.

B. (5 points) At the steady-state value of k, is there more or less capital than at the golden-rule level?

C. (5 points) Determine what saving rate would yield the golden-rule level of capital in this model.

D. (5 points) In the context of this neoclassical growth model, can a country have *too much* saving?

4. Answer the following two questions:

A. With a consumption function $C = 100 + 0.8Y_d$ (Y_d, the disposable income, is defined as income after taxes: $Y_d = Y - T$), investment $I = 200$, government expenditure $G = 100$, transfer payment $TR = 62.5$, tax revenue $T = 0.25Y$, compute

   a. (4 points) the equilibrium national income;

   b. (4 points) the balanced budget multiplier for this economy.

B. For a country with the following macroeconomic statistics: national income=5000; disposable income=4000; government budget deficit=200; consumption=3500; and trade deficit=100, compute levels of

   a. (4 points) saving;

   b. (4 points) investment;

   c. (4 points) government expenditure for this country.

| 備　　　註 | 一、作答於試題上者，不予計分。
二、試題請隨卷繳交。 |

考 試 科 目	財務管理 4122B	系 所 別	金融學系/財務工程組	考 試 時 間	2 月 18 日(六) 第 一節

I. Explain the following term briefly (24 points, each 4 points)

1.　Simple interest.

2.　The present value of a perpetuity

3.　Junk bonds.

4.　Yield to maturity.

5.　Strong-form efficiency.

6.　DOL

II. Computational Questions (30 points, each 5 points)

1.　How much must be invested today in order to generate a 5-year annuity of $1,000 per year, with the first payment 1 year from today, at an interest rate of 12%?

2.　What is the coupon rate for a bond with 3 years until maturity, a price of $1,053.46, and a yield to maturity of 6%? Interest is paid annually.

3.　What would be the approximate expected price of a stock when dividends are expected to grow at a 25% rate for 3 years, then grow at a constant rate of 5%, if the stock's required return is 13% and next year's dividend will be $4.00?

4.　What is the value of the PVGO for a stock with a current price of $50, expected earnings of $6 per share, and a required return of 20%?

5.　Because of its age, your car costs $4,000 annually in maintenance expense. You could replace it with a newer vehicle costing $8,000. Both vehicles would be expected to last 4 more years. If your opportunity cost is 8%, by how much must maintenance expense decrease on the newer vehicle to justify its purchase?

6.　Where will the following projects plot in relation to the security market line if the risk-free rate is 6% and the market risk premium is 9%? Which projects should be undertaken?

Project	Beta	IRR
A	2.0	25%
B	1.6	22%
C	1.1	15%
D	0.8	11%

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III. Short Answer Questions (12 points)

1. The use of NPV as an investment criterion is said to be more reliable than using IRR. Discuss potential problems with the use of IRR. (8 points)

2. What is the difference between unique risk and market risk to the holder of a diversified portfolio? (4 points)

IV. Questions (34 points)

1. Calculate the expected return (4 points), variance (4 points), and standard deviation (2 points) for an equally weighted portfolio of Stocks A and B given the following:

Scenario:	Probability	Return on A	Return on B
Recession	25%	-4%	9%
Normal	40%	8%	4%
Boom	35%	20%	-4%

2. Calculate the nominal return, real return, nominal risk premium, and real risk premium for the following common stock investment: (Show your work) (16 points, each 4 points)

Purchase price	$60 per share
Dividend	$3.50 per share per year
Sales price	$73 per share
Holding period	1 year
Treasury bill yield	8.5%
Inflation rate	7.5%

3. Determine the expected return on equity for a firm with a WACC of 12%, $500,000 in 9% debt, and $800,000 in equity. Both debt and equity are shown at market values, and the firm pays no taxes. How can the expected return on equity be reduced? (8 points, each 4 points)

備 註	一、作答於試題上者,不予計分。 二、試題請隨卷繳交。

考　試　科　目	統計學 B 4221	所　別	金融學系 財務工程組	考 試 時 間	2 月 18 日（六）第二節

1. Let X_t be a return and follow a normally distributed random variable with mean $\left(r - \frac{1}{2}\sigma^2\right)t$ and variance $\sigma^2 t$, i.e. $X_t \sim N\left((r - \frac{1}{2}\sigma^2)t, \sigma^2 t\right)$. If $S_t = S_0 e^{X_t}$ where S_t denotes the stock price at time t, then the stock price S_t is said to be lognormally distributed random variable.

   (1).(10%) Please show that $e^{-rt}S_t$ is martingale, and find the price of the futures at time 0. (i.e., what is $E(S_t)$)

   (2).(10%) Find the probability $P(S_t > K)$ for a positive real number K and a given cumulative standard normal distribution $N(\bullet)$ where $N(d) = \int_{-\infty}^{d} \frac{1}{\sqrt{2\pi}} \exp\left\{-\frac{y^2}{2}\right\} dy$. (i.e., the probability which the stock price exceeds K at time t).

   (3).(15%) Compute the price of the call option at no-arbitrage opportunity, $E\left(e^{-rt}(S_t - K)\, 1_{\{S_t > K\}}\right)$, where $1_{\{S_t > K\}}$ denotes the indicator function. (i.e, the expectation of the profit $(S_t - K)$ when the stock price exceeds K at time t).

   (4). (5%) Please explain what is the no-arbitrage opportunity or condition for the problem (3).

   (5).(10%) If the answer of the problem (3) is the pricing formula of the call option with the underlying stock, please find five parameters for the pricing formula, which parameter have to estimate, and how to estimate the parameter.

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2. A stochastic process $\{X(t), t \geq 0\}$ is said to be a compound Poisson process if it can be represented as

$$X(t) = \sum_{i=1}^{N(t)} Y_i, \qquad t \geq 0$$

where $\{N(t), t \geq 0\}$ is a Poisson process with a arrival rate λt, and $\{Y_i, i \geq 0\}$ is a family of independent and identically distributed random variables from an exponential distribution with the parameter β, where the density function is $f(y) = \beta \exp(-\beta y)$. Assume that $\{Y_i, i \geq 0\}$ are also independent of $\{N(t), t \geq 0\}$.

(1).(10%)Please find the mean and variance of $X(t)$.

(2).(10%) Please find the mean and variance of $\exp\{X(t)\}$. (i.e., $A = E(\exp\{X(t)\}) = \exp(kt)$,

$B = Var(\exp\{X(t)\})$)

(3).(15%) Please show $\exp\{X(t) - kt\}$ to be martingale and find k.

(4).(15%) Please find the estimators λ, μ and σ^2 when you have the data of 2 samples with the arrival numbers $(n_1, n_2, ..., n_t)$ and the values of $\{(y_1, y_2, ..., y_{n_1}), (y_1, y_2, ..., y_{n_2}), ..., (y_1, y_2, ..., y_{n_t})\}$ based on maximum likelihood or the method of moment estimation?

備　　註	一、作答於試題上者，不予計分。 二、試題請隨卷繳交。