1. (30 分)

    (a) (10 分) Identify the stationary points of the function.

    $$f(x_1, x_2, x_3) = 2x_1^2 - 8x_1x_2 + 2x_2^2 + 4x_2x_3 + 3x_3^2 - 22x_3 + 56$$

    (b) (10 分) Use the sufficient condition to determine if this represents a local maximum or a local minimum.

    (c) (10 分) Use the sufficient condition to determine if this represents a global maximum or a global minimum.

2. (20 分) Use the Lagrangian multiplier method to determine the optimal values for each constrained optimization problem's choice variables. Use the sufficient condition to determine if they represent local maxima or local minima.

    (a) $g = x^{0.4}y^{0.5}z^{0.1}$ subject to $2x + 6y + z = 60$

    (b) $y = x^2 + 2z^2$ subject to $2x + z = 9$

3. (10 分) Consider a constrained problem in which the objective function is $f(x_1, x_2, x_3)$ and there is one constraint $g(x_1, x_2, x_3) = c$. Use this constrained problem to prove the following statement: "The Lagrange multiplier represents the change in the optimum value of the objective function with a small change in the constraint."

4. (10 分) Assume a monopolist faces a demand function

    $$Q = \alpha - \beta P,$$

    where P is the price of the good and Q is its quantity. The monopolist's marginal cost is $\gamma Q + \theta$. Determine the level of output and price the monopolist should set in order to maximize her profits.

5. (10 分) Find the solution to the following differential equation. You must identify the steady state point and characterize it as stable or unstable.
    $$\dot{x}(t) = 2x(t) + 5, \ x(0) = 1$$

6. (20 分) Integrate each function.

    (a) $\int \frac{x}{2}e^{(x^2/4)}dx$

    (b) $\int x^2 \ln(x)dx$

壹、申論題 (70%)

1. 現代民族國家的體制主要可以區分為「單一型體制」、「聯邦體制」與「邦聯體制」等三種類型。請問這三種體制的意涵為何？其又有何不同之處？請舉實例比較與說明。(35%)

2. 請翻譯與評述下列文字：

Democratization refers to the transition from authoritarianism to liberal democracy. The most important features of this process are the granting of basic freedoms and particularly political rights, the establishment of popular and competitive elections, and (especially in post communist regimes) the introduction of markets reforms. Democratization encompasses three, sometimes overlapping, processes. First, the old regime breaks down; this usually involves a loss of legitimacy, generally linked to economic failure and the faltering loyalty of the police and military. Second, 'democratic transition' witnesses the construction of new liberal-democratic structures and processes. Third, 'democratic consolidation' sees these new structures and processes becoming so embedded in the minds of elites and the masses that their removal becomes unthinkable. Democracy thus becomes 'the only game in town'. (35%)

貳、名詞解釋 (30%) (每題 6 分)

1. Policy network
2. Deliberative democracy
3. New Right
4. Clientelism
5. Pork barrel legislation

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

_____ 1. When society requires that firms reduce pollution, there is
   a. a tradeoff because of reduced incomes to the firms' owners, workers, and customers.
   b. no tradeoff, since everyone benefits from reduced pollution.
   c. no tradeoff for society as a whole, since the cost of reducing pollution falls only on the firms affected by the requirements.
   d. a tradeoff only if some firms are forced to close.

_____ 2. In the circular-flow diagram,
   a. income from factors of production flows from firms to households.
   b. goods and services flow from households to firms.
   c. factors of production flow from firms to households.
   d. spending on goods and services flow from firms to households.

Table 1

	Labor Hours Needed to Make 1 Pound of:		Pounds produced in 40 hours:	
	Meat	Potatoes	Meat	Potatoes
Farmer	8	2	5	20
Rancher	4	5	10	8

_____ 3. Refer to Table 1. The opportunity cost of 1 pound of potatoes for the farmer is
   a. 8 hours of labor.
   b. 2 hours of labor.
   c. 4 pounds of meat.
   d. 1/4 pound of meat.

_____ 4. Suppose that a worker in Agland can produce either 10 units of organic grain or 2 units of incense per year, and a worker in Zenland can produce either 5 units of organic grain or 15 units of incense per year. There are 20 workers in Agland and 10 workers in Zenland. Currently the two countries do not trade. Agland produces and consumes 100 units of grain and 20 units of incense per year. Zenland produces and consumes 50 units of grain and no incense per year. The combined output of the two countries is therefore 150 units of grain and 20 units of incense per year. If the two countries decided to trade, and completely specialized in producing the good for which each has a comparative advantage, the combined yearly output of the two countries would be
   a. 50 units of grain and 40 units of incense.
   b. 200 units of grain and 150 units of incense.
   c. 150 units of grain and 20 units of incense.
   d. 200 units of grain and 300 units of incense.

_____ 5. When the price of bubble gum is $0.50, the quantity demanded is 400 packs per day. When the price falls to $0.40, the quantity demanded increases to 600. Given this information and using the midpoint method, you know that the demand for bubble gum is
   a. inelastic.
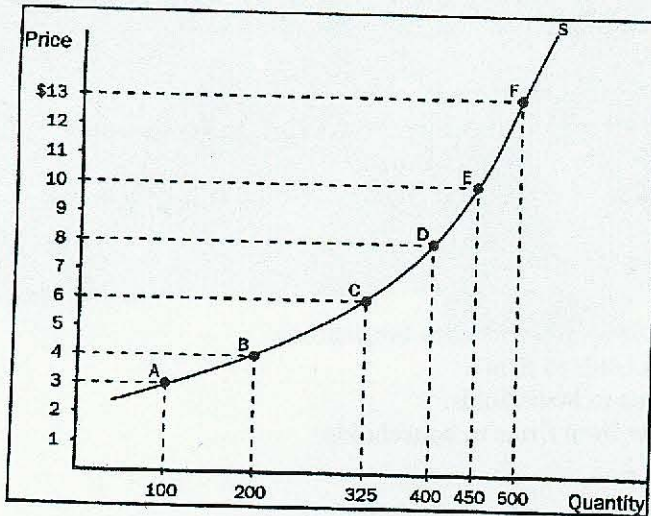   b. elastic.
   c. unit elastic.
   d. perfectly inelastic.

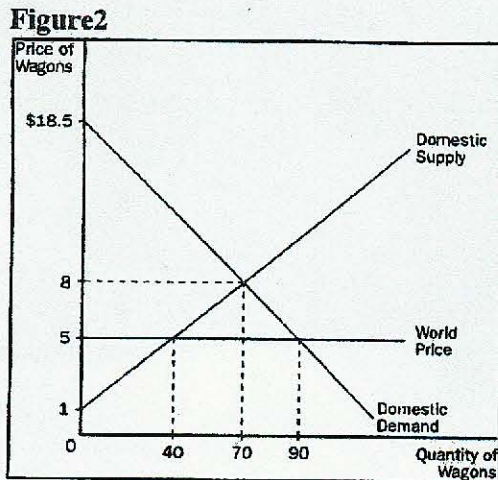**Figure 1**

6. Refer to Figure 1. What is the elasticity of supply between points D and E?
   a. 1.89
   b. 1.26
   c. 0.53
   d. 0.34

7. In the housing market, rent controls cause quantity supplied to
   a. fall and quantity demanded to fall.
   b. fall and quantity demanded to rise.
   c. rise and quantity demanded to fall.
   d. rise and quantity demanded to rise.

8. If a tax is imposed on a market with elastic demand and inelastic supply,
   a. buyers will bear most of the burden of the tax.
   b. sellers will bear most of the burden of the tax.
   c. the burden of the tax will be shared equally between buyers and sellers.
   d. it is impossible to determine how the burden of the tax will be shared.

9. If the cost of producing sofas decreases, consumer surplus will
   a. increase, then decrease.
   b. decrease.
   c. remain constant.
   d. increase.

10. Marylyn and Rebecca sell lemonade on the corner. Each glass costs them $0.05 to make. At the end of the day, they have sold 50 glasses and received a total producer surplus of $12.50. That would mean that Marylyn and Rebecca sold each glass for
    a. $0.15.
    b. $0.20.
    c. $0.25.
    d. $0.30.

11. Which of the following would likely have the smallest deadweight loss?
    a. a head tax (i.e., a tax everyone must pay regardless of what one does or buys)
    b. an income tax
    c. a tax on compact discs
    d. a tax on caviar
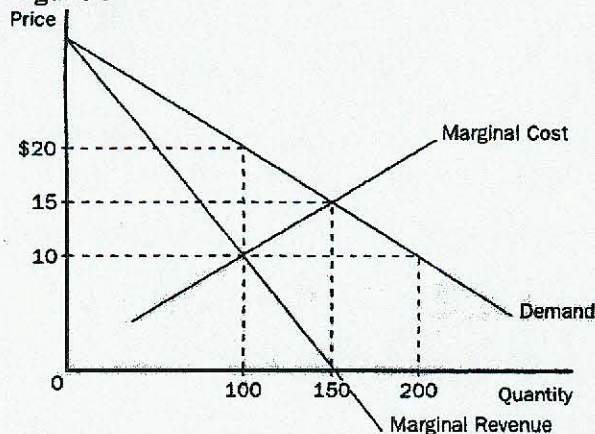
Figure2

___ 12. Refer to Figure 2. If this country allows free trade in wagons, producers will
   a. lose by $210.
   b. lose by $165.
   c. gain by $45.
   d. gain by $210.

___ 13. A tariff is a tax placed on
   a. exported goods that lowers the domestic price below the world price.
   b. exported goods that keeps the domestic price the same as the world price.
   c. imported goods that lowers the domestic price below the world price.
   d. imported goods that raises the domestic price above the world price.

___ 14. Which of the following would NOT be considered a negative externality?
   a. Smelter, Inc. creates steel and pollution in Anytown, U.S.A.
   b. Your friend buys a new puppy that barks every night.
   c. You have an adverse reaction to a medication your doctor prescribed for you.
   d. Your neighbor buys the most powerful stereo money can buy for his patio.

___ 15. Both public goods and common resources are
   a. rival.
   b. nonrival.
   c. excludable.
   d. nonexcludable.

___ 16. On hot summer days, electric-generating capacity is sometimes stretched to the limit. At these times, electric companies sometimes ask people to voluntarily cut back on their use of electricity. An economist might say that
   a. every electric customer has an incentive to prevent the system from overloading, so this voluntary approach is the most efficient.
   b. it would be more efficient if the electric company raised its rates for electricity at peak times.
   c. it would be more efficient to have a lottery to decide who had to cut back their use of electricity at peak times.
   d. it would be more efficient to force everyone to cut their usage of electricity by the same amount.

___ 17. Rank the following state and local government expenditure categories from largest to smallest.
   a. education, public welfare, highways
   b. transfer payments to the poor, education, public safety

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   c. police, road maintenance, public schools
   d. public health, public safety, public utilities

18. Johnny is a sophomore in college and has a 1.5 cumulative grade point average (GPA). Johnny's cumulative GPA will be better next semester if he
   (i)   performs better than he did last semester.
   (ii)   performs better than his cumulative GPA.
   (iii)   gives an average performance.

   a. (ii) only
   b. (iii) only
   c. (i) and (iii)
   d. All of the above are correct.

19. When marginal cost is rising, average variable cost
   a. must be rising.
   b. must be falling.
   c. must be constant.
   d. could be rising or falling.

20. A competitive market is in long-run equilibrium. If demand decreases, we can be certain that price will
   a. fall in the short run. All firms will shut down and some of them will exit the industry. Price will then rise.
   b. fall in the short run. No firms will shut down, but some of them will exit the industry. Price will then rise.
   c. fall in the short run. All, some, or no firms will shut down, and some of them will exit the industry. Price will then rise.
   d. not fall in the short run because firms will exit to maintain the price.

21. For a monopolist, marginal revenue is
   a. positive when the demand effect is greater than the supply effect.
   b. positive when the monopoly effect is greater than the competitive effect.
   c. negative when the price effect is greater than the output effect.
   d. negative when the output effect is greater than the price effect.

Figure 3

22. Refer to Figure 3. The deadweight loss caused by a profit-maximizing monopoly amounts to
   a. $150.
   b. $200.
   c. $250.

d. $300.

23. As the number of firms in an oligopoly increases,
   a. each seller becomes more concerned about its impact on the market price.
   b. the output effect decreases.
   c. the quantity of output becomes closer to the socially efficient quantity.
   d. All of the above are correct.

24. When a firm operates at efficient scale,
   a. its average revenue must exceed the minimum of average total cost.
   b. its average revenue must be equal to the minimum of average total cost.
   c. the average-total-cost curve must be falling.
   d. the average-total-cost curve must be rising.

25. Aurora Custom Cabinets produces and sells custom kitchen cabinets. The firm has determined that if it hires 10 workers, it can produce 4 sets of cabinets per day. Alternatively, if it hires 11 workers, it can produce 4.2 sets of cabinets per day. It sells each set of cabinets for $2,000, and it pays each of its workers $200 per day.
   a. For the 11th worker, the value of the marginal product of labor is $500.
   b. For the 11th worker, the marginal revenue product is $400.
   c. The firm is maximizing its profit.
   d. If the firm is employing 11 workers, then its profit would increase if it cut back to 10 workers.

26. Which of the following statements is correct? An individual worker's labor supply curve
   a. can never slope downward.
   b. slopes downward if that person responds to a higher wage by taking fewer hours of leisure per week.
   c. slopes downward if that person responds to a higher opportunity cost of leisure by working fewer hours per week.
   d. is horizontal if that person works the same number of hours per week, regardless of the opportunity cost of leisure.

27. Coal mining is a dangerous and dirty job. Suppose someone developed new machinery that made coal mining safer and cleaner at the same time it made coal miners more productive. We would expect that the wages of coal miners would
   a. rise.
   b. fall.
   c. stay exactly the same.
   d. rise, fall or stay the same.

28. In the parable of the leaky bucket, a fundamental problem with government redistribution programs is identified. As long as the government only has "leaky buckets" at its disposal
   a. affirmative action programs are doomed to failure.
   b. it should not try to reach complete equality in income.
   c. full egalitarian policies will always dominate competing policy options.
   d. equality of economic opportunity is an unattainable goal.

29. The substitution effect of a wage decrease, in the work-leisure model, is when the worker
   a. wishes to work less.
   b. wishes to work more.
   c. is indifferent between working more or less.
   d. wishes to work more but be less productive.

30. On car insurance policies, State Ranch Insurance Company offers drivers an option: Policy 1 features a deductible of $2,000 and it requires a driver to pay an annual premium of $500; Policy 2 features a deductible of $500 and it requires a driver to pay an annual premium of $750.
   a. In offering these two policies, State Ranch is engaging in price discrimination.

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    b. In offering these two policies, State Ranch is attempting to sort out the safe drivers from the risky drivers.

    c. Policy 1 is more of a burden for safe drivers than it is for risky drivers.

    d. All of the above are correct.

31. Over time people have come to rely more on market-produced goods and less on goods that they produce for themselves. For example people eat at restaurants relatively more and prepare their own meals at home relatively less. By itself this change would

    a. make GDP fall over time.

    b. not make any change in GDP over time.

    c. make GDP rise over time.

    d. change GDP, but in an uncertain direction.

32. An inflation rate calculated using the CPI shows the rate of change of

    a. all prices.

    b. the prices of all final goods and services.

    c. the prices of all consumer goods.

    d. the prices of some consumer goods.

33. In 2002 real GDP in Latania was 750 billion and the population was 3 million. In 2003 real GDP was 907.5 and the population was 3.3 million. What was the approximate growth rate of real GDP per person?

    a. 10 percent

    b. 14 percent

    c. 17 percent

    d. 21 percent

34. Suppose that real GDP grew more in Country A than in Country B last year.

    a. Country A must have a higher standard of living than country B.

    b. Country A's productivity must have grown faster than country B's.

    c. Both of the above are correct.

    d. None of the above are correct.

35. Queen City Sausage stock is selling at $40 per share, it has retained earnings of $2.00 per share and dividends of $.50 per share. What is the price-earnings ratio and what is the dividend yield?

    a. 20, 1.25 percent

    b. 20, 6.25 percent

    c. 16, 1.25 percent

    d. None of the above are correct.

36. Other things the same, if the government increases transfer payments to households, then

    a. investment will rise.

    b. the rate of interest will rise.

    c. public saving will rise.

    d. the market for loanable funds will be unaffected.

37. Alex says that $400 saved for one year at 4 percent interest has a smaller future value than $400 saved for two years at 2 percent interest. Brian says that the present value of $400 one year from today if the interest rate is 4 percent is worth more than the present value of $400 two years from today if the interest rate is 2 percent.

    a. Alex and Brian are both correct.

    b. Alex and Brian are both incorrect.

    c. Only Alex is correct.

    d. Only Brian is correct.

38. A fall in the rate of interest will

    a. reduce investment primarily because it will reduce the present value of future revenues expected from investment projects.

    b. reduce investment primarily because it will increase the present value of current

construction costs.

c. increase investment primarily because it will increase the present value of future revenues expected from investment projects.

d. increase investment primarily because it will reduce the present value of current construction costs.

39. When unions raise wages in some sectors of the economy, the supply of labor in other sectors of the economy
   a. decreases, raising wages in industries that are not unionized.
   b. decreases, reducing wages in industries that are not unionized.
   c. increases, raising wages in industries that are not unionized.
   d. increases, reducing wages in industries that are not unionized.

40. If reserve requirements are decreased, the reserve ratio
   a. decreases, the money multiplier increases, and the money supply decreases.
   b. increases, the money multiplier increases, and the money supply increases.
   c. decreases, the money multiplier increases, and the money supply increases.
   d. increases, the money multiplier increases, and the money supply decreases.

41. When the money market is drawn with the value of money on the vertical axis, if the price level is above the equilibrium level, there is a
   a. shortage, so the price level will rise.
   b. shortage, so the price level will fall.
   c. surplus, so the price level will rise.
   d. surplus, so the price level will fall.

42. Velocity in the country of Nemedia is always stable. In 2001, the money supply was $100 billion and real GDP was $300 billion. In 2002, the money supply increased by 10 percent, real GDP increased by 5 percent and nominal GDP equaled $660 billion. By how much did the price level increase between 2001 and 2002?
   a. 10 percent
   b. 9.5 percent
   c. 4.76 percent
   d. There is not enough information to answer the question.

43. Suppose that the exchange rate is 10 Moroccan dirhams per U.S. dollar. Also suppose that you can buy a crate of oranges for 300 dirhams in the Moroccan capital of Rabat and can buy a similar crate of oranges in Miami for $35 dollars.
   a. The real exchange rate is greater than one and arbitrageurs could profit by buying oranges in the United States and selling them in Morocco.
   b. The real exchange rate is greater than one and arbitrageurs could profit by buying oranges in Morocco and selling them in the United States.
   c. The real exchange rate is less than one and arbitrageurs could profit by buying oranges in the United States and selling them in Morocco.
   d. The real exchange rate is less than one and arbitrageurs could profit by buying oranges in Morocco and selling them in the United States.

44. Which of the following is the most likely result from an increase in the government's budget surplus?
   a. higher interest rates
   b. lower imports
   c. lower net capital outflows
   d. lower domestic investment

45. Which of the following is most likely to result if foreigners decide to withdraw the funds that they have loaned to the United States over the past two decades?
   a. U.S. net exports will rise.
   b. U.S. saving will rise.
   c. U.S. domestic investment will rise.

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         d. U.S. imports will rise.

____ 46. An increase in the interest rate causes investment to
    a. rise and the exchange rate to appreciate.
    b. fall and the exchange rate to depreciate.
    c. rise and the exchange rate to depreciate.
    d. fall and the exchange rate to appreciate.

____ 47. An increase in the expected price level shifts short-run aggregate supply to the
    a. right, and an increase in the actual price level shifts short-run aggregate supply to the right.
    b. right, and an increase in the actual price level does not shift short-run aggregate supply.
    c. left, and an increase in the actual price level shifts short-run aggregate supply to the left.
    d. left, and an increase in the actual price level does not shift short-run aggregate supply.

____ 48. The economy is in long-run equilibrium. Suppose that automatic teller machines become cheaper and more convenient to use, and as a result the demand for money falls. Other things equal, we would expect that in the short run,
    a. the price level and real GDP would rise, but in the long run they would both be unaffected.
    b. the price level and real GDP would rise, but in the longrun the price level would rise and real GDP would be unaffected.
    c. the price level and real GDP would fall, but in the long run they would both be unaffected.
    d. the price level and real GDP would fall, but in the long run the price level would fall and real GDP would be unaffected.

____ 49. Assuming crowding-out but no multiplier or investment-accelerator effects, a $100 billion increase in government expenditures shifts aggregate
    a. demand right by more than $100 billion.
    b. demand right by less than $100 billion.
    c. supply left by more than $100 billion.
    d. supply left by less than $100 billion.

____ 50. If technological change shifts the long-run aggregate supply curve to the right, it will also shift
    a. the short-run Phillips curve and the long-run Phillips curve to the right.
    b. the short-run Phillips curve and the long-run Phillips curve to the left.
    c. the short-run aggregate supply curve to the right and the long-run Phillips curve to the left.
    d. the short-run aggregate supply curve to the right and leave the long-run Phillips curve unaffected.