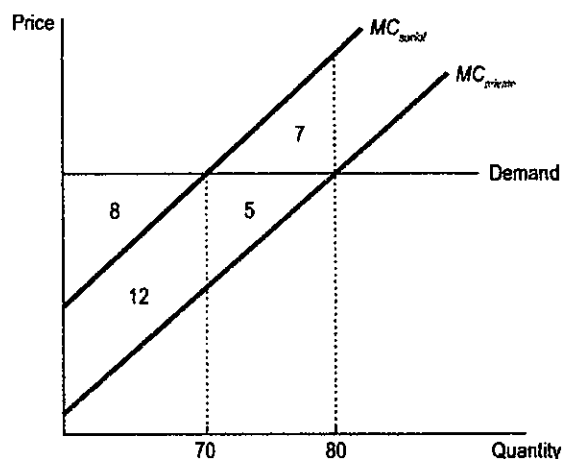


Notes: 選擇題請用 2B 鉛筆作答於答案卡，並先詳閱答案卡上之「畫記說明」。

- Answer ALL questions in English.
- For each multiple-choice question, select only ONE answer that you consider as the most appropriate.
- Total marks is 100.

Scenario A

A firm generates pollution that creates negative externality on neighboring households. The following graph shows the demand for the firm's product and the social marginal cost curve and the private marginal cost curve, which excludes externality. The numbers in the graph represent the corresponding areas. Please answer the following questions.



1. [4%] Suppose that there are no transaction costs, that there is no legal penalty for polluting, and that it is impossible for the neighbors to move away to avoid the pollution. The firm will produce a quantity of 80 to maximize its profit. If the neighbors are contemplating striking a deal with the firm and persuade the firm to reduce the quantity to 70, what is the price range of the deal?
(a) Between 5 and 7
(b) Between 12 and 24
(c) Between 8 and 20
(d) Between 7 and 20
(e) None of the above
2. [4%] Following the previous question, how much is the increase in social surplus (the total surplus of consumer, producer, and neighbors) from this deal?
(a) 5
(b) 7
(c) 8
(d) 12
(e) None of the above
3. [4%] Suppose transaction costs are so high that negotiation is impossible, and that it would cost the neighbors 6 to move away, how much is the resulting social surplus?
(a) 5
(b) 12
(c) 17
(d) 20
(e) None of the above

Scenario B

Suppose that Microsoft is the only producer of operating systems and Netscape is the only producer of Web browsers. Suppose also that nobody wants an operating system without a Web browser and nobody wants a Web browser without an operating system. Suppose that both firms produce at zero marginal cost and that the demand for a package consisting of an operating system and a browser is given by $Q=100-P$.

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4. [4%] Suppose that Microsoft first announces a price for its operating system, then Netscape takes this price as given and sets a price for its browser. What will be the price of an operating system and the price of a browser, respectively, if both firms maximize profit?
- (a) $100/3$ and $100/3$
 - (b) $200/3$ and $100/3$
 - (c) 75 and 50
 - (d) 50 and 25
 - (e) None of the above

5. [4%] Suppose that Microsoft merges with Netscape. Now what is the price for a package consisting of an operating system and a browser?
- (a) 50
 - (b) $200/3$
 - (c) 75
 - (d) 100
 - (e) None of the above

Scenario C

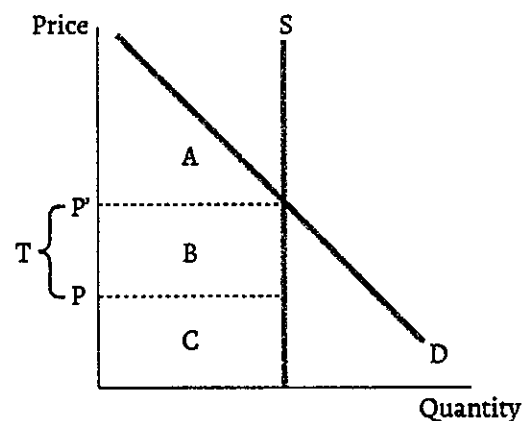
Suppose you are the monopoly owner of a movie theatre. You can allow people to enter the theatre at zero marginal cost, and you can provide popcorn at a constant marginal cost of \$0.50 per bag. You have two customers, Larry and Terry, who are identical twins. Larry never buys popcorn under any circumstances. If you charge the monopoly price of \$1.00 per bag for popcorn, Terry will buy 2 bags of popcorn and earn \$0.50 in consumer's surplus, and you will earn \$1.00 in profit from popcorn sales. If you charge the competitive price of \$0.50 per bag for popcorn, Terry will buy 4 bags of popcorn and earn \$2.00 in consumer's surplus, and you will earn no profit from popcorn sales.

6. [4%] Suppose that Larry is willing to pay up to \$8.00 to see the movie and Terry is willing to pay up to \$5.00 to see the movie. How much should you charge for admission to the theatre and how much should you charge for popcorn, respectively?
- (a) \$4.0 and \$0
 - (b) \$4.0 and \$1.0
 - (c) \$7.0 and \$0
 - (d) \$7.0 and \$1.0
 - (e) None of the above
7. [4%] Now, suppose that Larry is willing to pay up to \$4.00 to see the movie and Terry is willing to pay up to \$5.00 to see the movie. How much should you charge for admission to the theatre and how much should you charge for popcorn, respectively?
- (a) \$4.0 and \$0
 - (b) \$4.0 and \$1.0
 - (c) \$7.0 and \$0
 - (d) \$7.0 and \$1.0
 - (e) None of the above

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Scenario D

The National Taiwan University has a fixed number of parking spaces for students on campus. They are currently sold at a price that clears the market. It has been proposed that the price should be lowered and a lottery held to determine who may park on campus. Each winner of the lottery would receive a ticket entitling him to purchase a parking space, and these tickets could be freely bought and sold. The number of winners would be equal to the number of parking spaces. The graph on the right shows the supply and demand for parking spaces, where P' refers to the original market equilibrium price and P is the controlled price set by NTU.



8. [4%] Regarding the effects of the lottery plan, which of the following statement is NOT true?
- (a) The producer's surplus decreases from $B+C$ to C .
 - (b) The car users' surplus increases from A to $A+B$.
 - (c) The social surplus remains unchanged.
 - (d) The lottery winners gain from the lottery plan.
 - (e) None of the above
9. [4%] Now, alternatively, NTU implements the same lottery plan but bans any resale of tickets. Compared to the original lottery plan, which of the following statement is TRUE about the new plan?
- (a) The producer's surplus remains unchanged
 - (b) The car users' surplus remains unchanged
 - (c) The lottery winners' gain remains unchanged
 - (d) The social surplus remains unchanged
 - (e) None of the above

Scenario E

10. [4%] An influenza wave occurs and 600 people face a risk to die. The CDC offers two programs. The first program has two options: Under A, 200 people will be saved with certainty, while B will save everyone with a probability $1/3$ and save no one with a probability $2/3$. The second program also has two options: Under A, 400 people will NOT be saved with certainty, while B will save everyone with a probability $1/3$ and save no one with a probability $2/3$. More people prefer the first program to the second one because of
- (a) a nudge effect
 - (b) over confidence
 - (c) a framing effect
 - (d) an endowment effect
 - (e) loss aversion

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Scenario F (singleton questions)

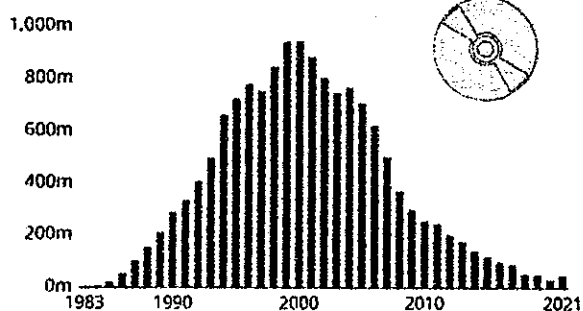
11. [2%] Amy weakly prefers to receive \$18 than to play a lottery that gives \$200 with a probability of 0.1 and 0 with a probability of 0.9. Terry strictly prefers to receive \$50 than to play a lottery that gives \$90 with a probability of 0.5 and \$10 with a probability of 0.5. Ben strictly prefers to receive \$300 today than to play a lottery that gives \$3000 tomorrow with a probability of 0.1 and 0 with a probability of 0.9. Name everyone who you are sure is risk-averse.
- (a) Amy
 - (b) Terry
 - (c) Ben
 - (d) Amy and Terry
 - (e) Amy, Terry, and Ben
12. [2%] Suppose that the nominal interest rate is 6% in country A and 4% in country B. However, the real interest rate is the same in the two countries. Under purchasing power parity, which one of the following statements is the most accurate?
- (a) The expected inflation in country A is higher by 2p.p than in country B, and the relative value of the currency of country A to country B will decrease by 2%.
 - (b) The expected inflation in country A is higher by 2p.p than in country B, and the relative value of the currency of country A to country B will increase by 2%.
 - (c) The expected inflation in country A is higher by 2p.p than in country B, and the relative value of the currency of country A to country B will increase by more than 2%.
 - (d) The expected inflation in country A is lower by 2p.p than in country B, and the relative value of the currency of country A to country B will increase by 2%.
 - (e) The expected inflation in country A is lower by 2p.p than in country B, and the relative value of the currency of country A to country B will decrease by 2%.
13. [2%] Country A produces wheat, flour, and bread. In 2023, country A produced \$2,000,000 of wheat and sold \$1,000,000 of wheat to consumers and the rest to a flour company. The flour company produced flour and sold \$800,000 of flour to consumers and \$400,000 of flour to a bakery. The bakery produced bread and sold \$2,000,000 of bread to consumers. By how much GDP of country A was increased out of the transactions explained above?
- (a) \$5,200,000
 - (b) \$4,000,000
 - (c) \$3,800,000
 - (d) \$3,200,000
 - (e) \$2,000,000
14. [2%] Which of the following increases money demand?
- | |
|---|
| i. The nominal interest rate increases. |
| ii. The price level increases. |
| iii. Real GDP increases. |
- (a) i, ii
 - (b) i, iii
 - (c) ii, iii
 - (d) ii, iv
 - (e) iii, iv

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15. [2%] If the government begins running a budget surplus, how does this affect the market for loanable funds?
- (a) The interest rate decreases because of a shift in the supply curve.
 - (b) The interest rate increases because of a shift in the supply curve.
 - (c) The interest rate decreases because of a shift in the demand curve.
 - (d) The interest rate increases because of a shift in the demand curve.
 - (e) There is no direct effect on the market.
16. [2%] In country A, a linear Philips curve predicts its economy well and the natural rate of unemployment is 4%. Before 2023, the expected inflation rate was 5% but the actual inflation rate in 2023 turned out to be 6% and the unemployment rate was 2%. Now in 2024, the expected inflation rate has become 6%. What will be the unemployment rate at the end of the year, if the inflation rate turns out to be 4%?
- (a) 2%
 - (b) 4%
 - (c) 6%
 - (d) 8%
 - (e) 10%
17. [2%] Suppose that CD albums were in the consumer's basket in 1983 – 2021, but the quantity varied from time to time. Referring to the following graph (provided by Statista.com), please choose the most accurate statement.

The Rise and Fall of the Compact Disc

CD album sales in the United States since 1983
(in million units)



- (a) If the decreasing sales of CD albums after 2000 was because a more convenient way of listening became available, then the consumption basket fixed in 2005 overstates the inflation in 2010.
- (b) If the decreasing sales of CD albums after 2000 was because a more convenient way of listening became available, then the fixed basket in 2005 understates the inflation in 2010.
- (c) If the market price of a CD album was stable from 1985 to 1990 and the consumer's basket was fixed in 1985, 1990's CPI overstated the typical consumer's cost of living.
- (d) If the market price of a CD album was increasing from 1985 to 1990 and the consumer's basket was fixed in 1985, 1990's CPI overstated the typical consumer's cost of living.
- (e) If the market price of a CD album was increasing from 2005 to 2010 and the consumer's basket was fixed in 2005, 2010's CPI overstated the typical consumer's cost of living.

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18. [2%] How does a 10% fall in prices affect the aggregate demand curve?
- (a) It shifts to the right by 10%
 - (b) It shifts to the left by 10%
 - (c) It shifts to the right by less than 10%
 - (d) It shifts to the left by less than 10%
 - (e) None of the above.
19. [2%] If the money supply grows 2 %, and the price level grows 1 %, then the real output should rise by how much?
- (a) 0 %
 - (b) $> 1 \% \text{ and } \leq 1.5 \%$
 - (c) $> 0.5 \% \text{ and } \leq 1 \%$
 - (d) $> 2 \% \text{ and } \leq 3 \%$
 - (e) $> 3 \%$
20. [2%] Which of the following is an example of adverse selection?
- (a) An investor buys bonds because she fears a recession.
 - (b) A person desires gains more than she fears losses.
 - (c) A person skips lunch because he is going to an all-you-can-eat buffet.
 - (d) A person buys fire insurance because his child likes to play with fire.
 - (e) None of the above.
21. [2%] In the long run, how should a decrease in inflation affect the economy?
- (a) It will increase the natural rate of unemployment.
 - (b) It will decrease the natural rate of unemployment.
 - (c) It will lower the nominal interest rate.
 - (d) It will depreciate the domestic currency in the foreign-currency exchange market.
 - (e) It decreases real GDP.
22. [2%] Suppose that you have \$1,000 in deposit. The nominal interest rate is 10 % and the inflation rate is 5 %. Which of the following statements is TRUE?
- (a) If the tax rate is as high as 50 %, your purchasing power with this deposit next year will be smaller than the purchasing power of \$1000 today.
 - (b) A year later, your purchasing power with the deposited money will increase by 10 %.
 - (c) If the tax rate is 5 %, the after-tax real interest rate is greater than the pre-tax real interest rate.
 - (d) Inflation increases your tax burdens.
 - (e) None of the above.
23. [2%] A Taiwanese citizen Ms. Yeh living in the US buys \$100,000 worth of TSMC stocks from Ms. Li living in Taiwan. What effect does this have on Taiwan's net capital outflows (NCO)?
- (a) NCO increases by \$100,000.
 - (b) NCO increases by more than \$100,000.
 - (c) NCO decreases by \$100,000.
 - (d) NCO decreases by more than \$100,000.
 - (e) NCO does not change.

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24. [2%] In a closed economy, what happens if investment exceeds saving?
- (a) Interest rates rise.
 - (b) Interest rates fall.
 - (c) The amount of loanable funds increases
 - (d) The amount of loanable funds decreases
 - (e) Investment cannot exceed saving in a closed economy.
25. [2%] There are two countries, 1 and 2. At the given level of factors of production other than the physical capital per capita (k_i), output per capita (y_i) is determined as $y_i = f(y_i)$ for $i = 1, 2$. For more than 100 years, country 1 has been richer than country 2. Which one of the following production functions can be an example of "catchup effect"?
- (a) $f(y) = y^{0.9}$
 - (b) $f(y) = y + 0.9$
 - (c) $f(y) = y^{1.9}$
 - (d) $f(y) = 1.9y$
 - (e) None of the above.
26. [2%] Country A and B are adjacent. Historically, in country A, there have been many unfilled residents who illegally crossed the border from country B. Today, the government of country A announced that they would issue residence certificate for the current illegal immigrants who have stable jobs. Suppose that the production function is constant returns to scale and all other factors of production than labor have not changed for a year. What would immediately happen to country A?
- (a) GDP increases.
 - (b) GDP per capita increases.
 - (c) GDP decreases.
 - (d) GDP per capita decreases.
 - (e) Firms hire more immigrants.
27. [2%] Maya is thinking of purchasing a twelve-acre lot for \$10,000, which can be sold one year later. With a probability of 50%, next year's price will increase by \$2,000 relative to this year. With another probability of 50%, the price will stay at \$10,000. The annual interest rate is 12%. Which one of the following statements is the most accurate?
- (a) If Maya were risk-neutral, then she would be indifferent between buying and not buying this lot.
 - (b) If Maya does not want to buy the lot, this implies that she is risk-averse.
 - (c) If Maya does not want to buy the lot, this implies that she is risk-neutral.
 - (d) If Maya wants to buy the lot, this implies that she is risk-neutral.
 - (e) If Maya wants to buy the lot, this implies that she is risk-loving.
28. [2%] The theory of purchasing-power parity says that lower inflation in a nation causes the nation's currency to _____, leaving the _____ exchange rate changed, _____ exchange rate unchanged.
- (a) depreciate, nominal, real
 - (b) depreciate, real, nominal
 - (c) appreciate, nominal, real
 - (d) appreciate, real, nominal
 - (e) unchanged, real, nominal

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29. [2%] Which of the following statements regarding the aggregate supply is true?

- (a) The aggregate supply curve has a positive slope in the long run.
- (b) Other things being equal, technological progress results in an increasing price level in the long run.
- (c) Other things being equal, the increases in firms' costs shift the short-run aggregate supply curve to the left.
- (d) The upward-sloping short-run aggregate-supply curve can be explained by the sticky-wage theory highlighting that menu costs could hinder quick adjustments to the external shocks in the economy.
- (e) None of the above.

30. [2%] Refer to the table below. If the velocity of money was stable from 2022 to 2023, which of the following statements is the most accurate?

Year	Price of apple	Apple's quantity produced	Price of guava	Guava's quantity produced
2022	\$20	100	\$10	200
2023	\$22	100	\$12	250

- (a) Money supply grew by more than 30% in 2023.
- (b) The real GDP decrease in 2023 relative to 2022.
- (c) The inflation rate in 2023 calculated by the GDP deflator is 20%
- (d) The money supply did not change.
- (e) None of the above.

Scenario G (short-answer questions) 請於試卷內之「非選擇題作答區」標明題號依序作答。

Questions 31 to 33 are short-answer questions. You are required to provide your answers, as well as the calculation process, in the answer sheets. Questions 31 and 32 are based on the same environment. For Question 31, please provide two numbers. For Question 32, please choose the right word in the first parenthesis and provide a number for the second parenthesis. In country A, 1,000 working-age people are living. Different people may have different levels of wealth. The distribution of wealth in country A is summarized as follows.

Wealth (α)	9	6	4	1	0
The number of people	200	200	200	200	200

In words, there are 200 people whose wealth level is \$9, another 200 people whose wealth level is \$6, and so on. Everyone is living alone and endowed with an indivisible unit of labor. Since the citizens of country A hate working, they suffer from the loss of utility by 2 if they work. When a person's wealth is $\$ \alpha$ and she is employed at the wage $\$ w$, then her utility is $\sqrt{\alpha + w} - 2$. If she does not work, her utility is $\sqrt{\alpha}$. Labor demand is a function of the wage. Specifically, labor demand is $1000 - 20w$.

31. [6%] At $w = 10$, what will be the labor force participation rate and unemployment rate?

32. [4%] The government enacts the minimum wage law, setting the minimum wage at \$15. How much percent of frictional/structural unemployment will this law create?

33. Lake Ontario can be freely accessed by fishermen. The cost of sending a boat out on the lake is $r > 0$. When b boats are sent out onto the lake, $f(b) = 800b - b^2$ fish are caught in total, where $0 \leq b \leq 800$. The price of fish is normalized to be 1, which is unaffected by the level of catch. Note that b is assumed to be a continuous variable.

- (a) [3%] What is the optimal number of boat to send out from the point of view of a central planner?
- (b) [3%] If there is no central planner, how many boats will be sent out?
- (c) [4%] Following part (b), what per-boat fishing tax (or subsidy) would restore the number of boats to your answer to part (a)?

試題隨卷繳回