注意事項：

題組一為是非題，請填答案卡：正確請填 A，反之填 B；其他題組(二~四)請於試卷內依序書寫答案，可以用中文書寫。

[題組一 25%] (一題 2.5 分，答錯倒扣 1 分)

Year 2016 witnessed falling competition in America, where profits have surged as industries have become more concentrated. A think-tank report in mid-2018 shows a similar-if not yet as severe-problem which has taken root across the Atlantic. That is bad for ordinary British people, who pay 25% more for goods and services than they did in 2008, even as wages have grown by merely 19%. Moreover, if Britain leaves the EU's regulatory bodies in concentrated industries such as telecoms and airlines-where profits are high in America but not in Britain- firms might find it easier to raise prices or lower quality. Brexit, the whiff of oligopoly risks turning people against capitalism.

If the British economy is split into 250-odd industry sectors, the four biggest firms in nearly 60% of them claim a larger share of revenues than they did a decade ago. Since the early 2000s the top 100 firms, excluding finance and oil, have seen their share of economy-wide takings creep up, from 18.5% to 23%. Profit margins have risen by nearly four-fifths since 1980, and are above the European average. So far, profits as a whole have not gobbled up a larger share of GDP, perhaps because small firms are doing worse and because the largest tech firms, such as Apple and Amazon, book profits offshore. But the long-run trend in profit margins is worrying.

By examining tech giants, the competition authorities hope to respond to general public unease about their market power and the battle for dominance. Although American and Chinese tech giants (such as FAANG in the US and BAT in China) have avoided each other in their home markets, and rising trade tensions make it ever less likely that a clash will happen there. Their battle for emerging markets has been beyond the radar. Over half of Google's revenues come from outside America; 8 of Facebook's 10 biggest territories by user base are emerging markets. Alibaba wants to raise the value of sales on its platform that are made abroad to 50% by 2025, implying stratospheric growth in places like India.

The followings are the True-or-False questions: fill in "A" if true, otherwise "B". 2.5% each and 1% penalty if wrong answer. Total score, after penalties, will not be negative.

1. The British economy is becoming more concentrated due to globalization and technological advances.
2. The market concentration metric, CR4, is a more fine-grained approach than the Herfindahl-Hirschman Index.
3. Higher concentration always imperils competition because leading firms grow and laggards shrink, weakening overall productivity.
4. A concentrated market not necessarily conduces to higher profits if it is subject to certain firm conducts.
5. The tech giants usually boost productivity by innovation, and their practices always spread quickly through the economy.
6. Tech giants should be penalized either because they are a source of disruption or because their rents/free cash flow are well above a hurdle rate, both reflecting their market dominance or a lack of competition.
7. If a post-Brexit government attempts to get big firms to invest so as to demonstrate the success of "Global Britain" implies a more active regulatory authority to cope with more mergers/acquisitions pursued by big firms.
8. Over time, many digital markets tend to become more concentrated, as size begets size and winners take most of the spoils.
9. The fight between American and Chinese tech giants has no or little political overtones because the giants have avoided each other in their home markets, and rising trade tensions make it ever less likely that a clash will happen in each other's home markets.
10. There should be limits for firm size because vast profits reflect products impossibly any more popular, or a concentration of market power that invites a competitive or political backlash.

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[題組二 25%] (一題 5 分)

Consider two competing firms in a declining industry. Firm A wants to cut the price to increase market share. Firm B is trying to preempt the price cutting. There are two markets that Firm A can cut the price. One market is for the high-end products and the other is for the low-end products. Firm B only has resources to preempt the price cutting in one of the two markets. It is more costly for Firm A to cut the price in the high-end market than in the low-end market, and also more costly for Firm B to preempt the price cutting in the high-end market than in the low-end case. The payoffs are as follows.

- If Firm A cuts the price in the high-end market, and Firm B preempts the price cutting in the high-end market, the payoff is 0 for Firm A and 2 for Firm B.
- If Firm A cuts the price in the high-end market, and Firm B preempts the price cutting in the low-end market, the payoff is 2 for Firm A and 1 for Firm B.
- If Firm A cuts the price in the low-end market, and Firm B preempts the price cutting in the high-end market, the payoff is 3 for Firm A and 0 for Firm B.
- If Firm A cuts the price in the low-end market, and Firm B preempts the price cutting in the low-end market, the payoff is 1 for Firm A and 3 for Firm B.

1. (True or false. Justify your answer.) If Firm B believes that Firm A randomizes in his choice of market for price cutting and cuts the price in the high-end market with probability 2/3, Firm B will maximize his expected payoff by preempting the price cutting in the high-end market with probability 2/3. (5%)
2. Find a Nash equilibrium in mixed strategies for this game. (5%)
3. In Nash equilibrium: What is the expected payoff for Firm A? What is the expected payoff for Firm B? What is the probability that Firm B preempts the price cutting successfully? (5%)

Imagine that the labor force consists of two types of workers: Able and Mediocre with equal proportions of each. Employers are not able to tell which type they are when they hire them. A worker is worth $1500 a month to its boss if he is Able and $1000 a month if he is Mediocre. The labor market is competitive and since employers cannot tell the Able from the Mediocre, all laborers are paid a wage equal to the productivity of an average worker. One consulting firm, Orange Services, claims that its monthly 30-hour course raises worker productivity by 20%. Firm XYZ believes that Orange Services' course is useful, and thus it will pay wages of $1500 for those who take the course and $1000 for those who do not.

Mediocre workers find Orange Services' course extremely challenging. To them, taking the course is as much as losing $20 per hour. Able workers find the course only a little challenging, and taking the course is as much as losing $5 per hour.

4. Which laborers stay with Firm XYZ? (5%)
5. What happens to the average productivity of laborers? (5%)

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[題組三 25%] (一題 2.5 分)

Before January 1, 1811, Neverland had been a closed economy and had been self-reliant.

Sir Monty Eco, the *Minister of Economic* Affairs, said, "Under the equilibrium condition, GDP Y is equal to aggregate expenditure. The IS equation describes service/good market equilibrium and loanable funds market equilibrium. The LM equation describes equilibrium in the market for real money balances."

Sir Wins, the Prime Minister, said, "Are we supposed to calculate net taxes as the difference between taxes paid to the government minus transfers received from the government?"

"Very true," Sir Monty Eco said, nodding to her.

Sir Wins asked Sir Monty Eco whether the sum of consumption, investment, and government expenditure is an accurate measure of aggregate expenditure.

"Very true," Sir Monty Eco said, nodding to her.

Sir Monty Eco presented to *Sir Wins the* following table regarding the economic numbers for the three previous years.

Real GDP	Aggregate Corporate Income Taxes Paid to the Government	Aggregate Personal Income Taxes Paid to the Government	Aggregate Transfers Received from the Government	Government Spending	Investment Spending	Consumption Spending	Private Saving
$24,000	$360	$ (a)	$300	$1,500	$780	$19,020	$4,380
$27,000	$375	$ (b)	$330	$1,500	$1,380	$21,420	$4,980
$30,000	$390	$ (c)	$360	$1,500	$1,980	$23,820	$5,580

Moreover, you are provided with the following information:

- Money Supply = M = $6,000.
- Aggregate Price Level = P = $1, Inflation rate = 2%.
- Assume that net taxes and government spending are both constant and exogenously given.
- Money Demand = $6,000 + 2Y$ – $8,700$r$
- Investment Demand = $I = I(r)$ = when investment is equal to $1,500 the equilibrium real interest rate is 5% and for each percentage increase in the interest rate, investment decreases by $300. For instance, when real interest rate increases from 5% to 5.1%, investment decreases by $30.
- The investment demand equation is linear with respect to the interest rate.

1. The proportion of an aggregate raise in pay that a consumer spends on the consumption of goods and services is constant. Derive the consumption function equation with respect to disposable income (Y - T) for Neverland based on all the information you have been given. (2.5%)
2. For the missing column labeled "Aggregate Personal Income Taxes Paid to the Government" in the above table, solve for (a), (b), and (c). (2.5%)
3. Derive an equation for the investment demand function for Neverland. Please write I on the left hand side of the equation.

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Namely, express investment as a function of the interest rate r. Write your equation in the form I = I (r). Base your equation on all the information you have been given. (2.5%)

4. Derive the IS equation for Neverland. (2.5%)
5. Derive the LM equation for Neverland. (2.5%)
6. What is the equilibrium value of the interest rate for Neverland? (2.5%)
7. The urban population of Neverland is 1,000. The total population of Neverland is 1,500. What is the equilibrium value of real GDP and per capita real GDP for Neverland? (2.5%)
8. In this economy suppose that net taxes are increased by $3,000. What is the change in real GDP (Y) predicted by the Keynesian Cross diagram? (2.5%)
9. In this economy suppose that net taxes are increased by $3,000. What may be the new equation of IS model? To answer this question, express real GDP as a function of the interest rate r. Namely, write real GDP on the left hand side of the equation. (2.5%)
10. On January 1, 1811, Neverland deregulated and the firms and households began to trade heavily in goods and services with other people and businesses in the international community, and a large amount of funds flow as investments across the border. Free trade takes the form of managerial exchange, technology transfers, and all kinds of goods and services.
Suppose the prevailing *world nominal interest rate was* 14% and the prevailing *world inflation rate* was 10%. Would there be capital flow into or out of Neverland? What would be the resulted equilibrium nominal interest rate in Neverland? (2.5%)

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[題組四 25%] (一題 5 分)

Consider a market in which Heinz competes with one other ketchup brand, which we refer to as generic ketchup. Every T days, the typical consumer buys either Heinz or generic ketchup. (The number of days between purchases is determined by the storage space in consumers' homes and how frequently they eat ketchup.) Each customer buys one unit each time. The generic is sold at a competitive price equal to its marginal cost of production of \$4.01 per unit. Suppose that Heinz's marginal cost is \$2 per unit (due to its large scale) and that, if it only sold to its loyal customers, it would charge a monopoly price of p_M, which is the profit-maximizing price given the demand curve of the loyal customers per day:

$$N_B = 100 - 10p$$

where N_B is the number of brand-loyal customer who is willing to purchase at the price p per day.

Heinz considers holding periodic sales to capture switchers' purchases. Switchers are price sensitive and buy the least expensive ketchup. They pay attention to price information and always know when Heinz is on sale. The total number of switchers is denoted as N_S.

Suppose that Heinz's pricing policy is to charge a sales price, p_S, once every T days. For the other $T-1$ days, Heinz sells at the regular, non-sale (monopoly) price of p_M. During a sale, the switchers buy enough Heinz to last them for T days until it is on sale again. All switchers were aware of the pattern and got on a schedule such that they always bought on sale. By contrast, the loyal customers' shopping schedules are determined independently and were not aware of this pattern. (e.g., Heinz placed ads announcing sales where primarily switchers would see the ads.) If the loyal customers find that Heinz is on sale, which happen $1/T$ of all days, those with high enough willingness-to-pay buy at the sale price. Otherwise, they pay for the regular price.

1. Determine the monopoly price, p_M, for loyal customers and the corresponding profit per day if Heinz sells only to loyal customers. (5%)
2. Determine the highest price, p_S, Heinz can charge and yet still attract switchers during a promotion. (5%)
3. Determine its average profit per day if Heinz uses the sale pricing scheme. (5%)
4. Under what conditions is the sales policy more profitable than selling at a uniform price to only loyal customers? Could Heinz make more money by altering its promotion pattern (more or less frequently)? Why or why not? Explain. (5%)
5. Is the profit with the sale pricing scheme higher than with the third-degree price discrimination that Heinz could set separate prices for loyal customers and for switchers? Why or why not? Explain. (5%)

試題隨卷繳回