注意：考試開始鈴響前，不得翻閱試題，
並不得書寫、畫記、作答。

國立清華大學 114 學年度碩士班考試入學試題

系所班組別：經濟學系

科目代碼：4801

考試科目：個體經濟學

－作答注意事項－

1. 請核對答案卷（卡）上之准考證號、科目名稱是否正確。
2. 考試開始後，請於作答前先翻閱整份試題，是否有污損或試題印刷不清，得舉手請監試人員處理，但不得要求解釋題意。
3. 考生限在答案卷上標記「由此開始作答」區內作答，且不可書寫姓名、准考證號或與作答無關之其他文字或符號。
4. 答案卷用盡不得要求加頁。
5. 答案卷可用任何書寫工具作答，惟為方便閱卷辨識，請儘量使用藍色或黑色書寫；答案卡限用 2B 鉛筆畫記；如畫記不清（含未依範例畫記）致光學閱讀機無法辨識答案者，其後果一律由考生自行負責。
6. 其他應考規則、違規處理及扣分方式，請自行詳閱准考證明上「國立清華大學試場規則及違規處理辦法」，無法因本試題封面作答注意事項中未列明而稱未知悉。

國立清華大學 114 學年度碩士班考試入學試題

系所班組別：經濟學系碩士班　　共 3 頁，第 1 頁

考試科目（代碼）：個體經濟學（4801）　　請在【答案卷　】作答

Part I

Please show your work in detail.

1. (20 points) Peter has income I to spend on ham (good x) and cheese (good y) to make sandwiches and toast is free. Suppose he always makes his sandwiches with exactly 1 slice of ham and 2 slices of cheese. He is set in this way and never changes these proportions. Denote ham as good x and cheese as good y. The price of a slice of ham (good x) is P_x and the price of a slice of cheese (good y) is P_y. Answer the following questions.

   (a) (2 points) Write down Peter's utility function for these two goods.

   (b) (8 points) Solve Peter's Marshallian demand function and compensated demand function for both goods.

   (c) (6 points) Suppose Peter's income is \$20 ($I = 20$) and $P_y = 1$. Now P_x decreases from \$3 to \$2 and his income and P_y did not change. Calculate the total effect (TE), the substitution effect (SE) and the income effect (IE) on the demand for ham (good x).

   (d) (4 points) Calculate the compensating variation (CV) and the equivalent variation (EV) for the price change in ham (good x).

2. (10 points) Considering the following production function:

$$q = A((BL)^{\rho} + K^{\rho})^{\frac{\gamma}{\rho}}$$

   for $\rho < 1$, $\rho \neq 0$ and $\gamma > 0$, where q is the output level, A is the neutral productivity, L represents labor input, B is the labor augmenting productivity and K represents the capital stock.

   (a) (4 points) Solve the marginal rates of technical substitution (MRTS) of L for K and the elasticity of substitution (σ).

   (b) (6 points) Suppose the wage (w) and capital rental (r) did not change. Now the neutral productivity (A) increases (B is fixed), how does the relative demand of labor (L/K) change? How does the answer change if the labor augmenting productivity (B) increase instead (A is fixed)?

3. (20 points) Considering a perfect competitive market. The demand function is $Q^D = 30 - 2P$ and the supply function is $Q^S = -10 + 2P$. Answer the following questions.

   (a) (7 points) Solve the equilibrium market price and quantity.

   (b) (7 points) Suppose the government provides a specific subsidy ($2 per unit). Solve the price the consumers paid and the equilibrium quantity.

   (c) (6 points) Solve the changes of consumer surplus, producer surplus and the deadweight loss under the subsidy policy.

Part II

1. [20 points]
   (a) Give an example of the Prisoner's Dilemma game and explain why it is a dilemma.
   (b) Give three reasons why the Prisoner's Dilemma game is important.
   (c) Give one situation in real life that is equivalent to a Prisoner's Dilemma game. Explain why.

2. [20 points]
   (a) Give an example of the Cournot game with two players and solve for the equilibrium. Compare the joint profit in Cournot equilibrium with the monopoly profit.
   (b) Are there externalities in the Cournot game? Why?
   (c) Give two reasons why the Cournot game is a problematic model.

3. [10 points]
   (a) There are three different, indivisible objects to be assigned to three different players. Each player demands exactly one object. Explain what is Pareto efficiency in this situation.
   (b) Find a way to assign the three objects to the three players so that Pareto efficiency is achieved.