注意：本試卷共有四頁。請考生答題前，務必閱讀每大項的注意事項說明！

第一部份：填空題（每題 5 分，共 50 分）

（1）Part I 有 10 題填空題，請自行製作答題區。規定如下：請於作答區第一頁「選擇題作答區」的下方製作第 1－10 格答題區。

第 1 格		第 6 格	
第 2 格		第 7 格	
第 3 格		第 8 格	
第 4 格		第 9 格	
第 5 格		第 10 格	

（2）每格答對得 5 分，答錯或未作答 0 分。

（3）答題不要求任何計算過程，只依答案格內的答案對錯給分。

（4）如果沒有特別指示，請將答案約分至最簡分數表示。

Part I：填空題（每格 5 分，共 50 分）

A. Branch of economics that deals with the behavior of individual economic units, i.e., consumers, firms, workers, and investors, as well as the markets that these units comprise is called ___(1)___.

B. ___(2)___ can show that amount by which the quantity of one input can be reduced when one extra unit of another input is used, so that output remains constant.

C. A good that has a negative income effect is called ___(3)___.

D. When an industry whose long-run supply curve is upward sloping, it is called ___(4)___.

E. When a buyer and a seller possess different information about a transaction, this situation is called __(5)__ .

F. Suppose that two investments have the same three payoffs, but the probability associated with each payoff differs, as illustrated in the table below:

Payoff	Probability (**Investment** A)	Probability (**Investment** B)
$300	0.10	0.30
$250	0.80	0.40
$200	0.10	0.30

The expected return of Investment A is __(6)__ and the standard deviation of Investment B is __(7)__ . If Ms. Tsai has the utility function $U = 10 \cdot I$, where I denotes the payoff, she will choose investment __(8)__ . If Mr. Chen has the utility function $U = 10 \cdot \sqrt{I}$, he will choose investment __(9)__ . Again, if Mr. Ma has the utility function $U = 10 \cdot I^2$, he will choose investment __(10)__ .

第二部份：計算說明題（50 分）

（1）Part II 有三題計算說明題，請標示清楚，並將所有過程、步驟交代清楚。

（2）如果沒有特別指示，請將答案約分至**最簡分數**表示。

Part II：計算說明題

1. Suppose that there are two goods (x and y) and a consumer. Let p_x and p_y be the prices of goods x and y, respectively, and let $\big(q_x(p_x,p_y),q_y(p_x,p_y)\big)$ be the consumer's consumption bundle for goods x and y when prices are (p_x,p_y).

   (1) Give a definition of weak axiom of revealed preference (WARP). **(5 points)**

   (2) When prices are $(p_x,p_y)=(2,3)$, $\big(q_x(2,3),q_y(2,3)\big)=(1,2)$, and when prices are $(p_x,p_y)=(3,2)$, $\big(q_x(3,2),q_y(3,2)\big)=(2,2)$. Does this behavior violate WARP? Why? **(5 points)**

   (3) When prices are $(p_x,p_y)=(1,3)$, $\big(q_x(1,3),q_y(1,3)\big)=(2,2)$, and when prices are $(p_x,p_y)=(3,1)$, $\big(q_x(3,1),q_y(3,1)\big)=(3,1)$. Does this behavior violate WARP? Why? **(5 points)**

2. Suppose that a monopoly faces the inverse demand curve $P(Q) = 2Q^{-0.5}$, and the monopoly's cost function is $C(Q) = 0.5 \cdot Q$.

(1) What are the monopoly's profit-maximizing price and quantity? What is the monopoly's resulting profit? What is the resulting consumer surplus? **(6 points)**

(2) Suppose that the government regulatory agency imposes a specific tax of $\tau \geq 0$ per unit on the monopoly. What are the monopoly's profit-maximizing price and quantity? What is the resulting consumer surplus? What is the total tax revenue collected by the government? Moreover, what is the optimal tax rate $\tau^* \geq 0$ which maximizes the sum of consumer surplus and total tax revenue received by the government? **(8 points)**

(3) Suppose that the government regulatory agency sets a price ceiling of $p_R \geq 0$ per unit on the monopoly. What are the monopoly's profit-maximizing price and quantity? What is the resulting consumer surplus? Moreover, what is the optimal price ceiling $p_R^* \geq 0$ which maximizes consumer surplus? **(6 points)**

3. Consider a duopoly model with differentiated products as follows. Firms 1 and 2 face the following demand functions:

$q_1(p_1, p_2) = 1 - p_1 + 0.5 \cdot p_2$, and $q_2(p_1, p_2) = 1 - p_2 + 0.5 \cdot p_1$, respectively.

Suppose that firm 1's cost function is $c_1(q_1) = q_1$, and firm 2's cost function is $c_2(q_2) = q_2$.

(1) Give a definition of Nash equilibrium. **(5 points)**

(2) If firms 1 and 2 compete by setting prices simultaneously, then what are the Bertrand equilibrium quantities and prices? **(5 points)**

(3) If firms 1 and 2 compete by setting prices sequentially, that is firm 1 sets first and then firm 2 sets price after she observes firm 1's price, then what are the Stackelberg equilibrium quantities and prices? **(5 points)**