一、選擇題，單選，每題 3 分，共 30 分

1. Sometimes coffee growers in Brazil have destroyed some or all of their coffee
crops in order to keep it from going to market. The best explanation for this type
of action on the part of the growers is that they believed that:
   a) coffee was an inferior good.
   b) there was an international shortage of coffee.
   c) they faced an inelastic supply of coffee.
   d) the demand for coffee had an elasticity coefficient greater than zero but less
   than one.

2. The demand function for apples is \( Q_A = 200 - 4p_A + 2p_B \) and the demand
function for bananas is \( Q_B = 200 - 3p_B + p_A \), where \( p_A \) and \( p_B \) are respectively
the price of apples and bananas. If the fixed supply of apples is 130 and the fixed
supply of bananas is 120, then the equilibrium price of apples is
   a) $32.
   b) $37.
   c) $41.
   d) $49.

3. A firm faces a demand function \( D(P) \), for which the revenue-maximizing price is
$20. The demand function is altered to \( 2D(P) \). What is the new
revenue-maximizing price?
   a) $10.
   b) $20.
   c) $40.
   d) There is insufficient information to determine this.

4. Suppose that you used regression analysis to statistically estimate the demand
function for widgets. Your estimated function is \( Q = P_w^{2.1}P_a^{2.8}P_b^{1.2}I \), where \( P_w \) is
the price of widgets; \( P_a \) is the price of good a; \( P_b \) is the price of good b; \( I \) is the
consumer’s money income. Form this information, it would be correct in
concluding that:
   a) the demand curve for widgets is upward sloping.
   b) the price elasticity of demand for widgets is -2.1.
   c) widgets and good b are substitutes.
   d) widgets can be considered an inferior good.
5. If a consumer purchases good A rather than good B, then
   a) when A is not cheaper than B, we can infer that the consumer prefers A to B.
   b) when A is not cheaper than B, we can infer that the consumer prefers B to A.
   c) when B is not cheaper than A, we can infer that the consumer prefers A to B.
   d) when B is not cheaper than A, we can infer that the consumer prefers B to A.

6. Harmon's utility function is \( U(x, y) = xy \). His income is $100. The price of good
   \( y \) is \( P_y = 4 \). Good \( x \) is priced as follows. The first 15 units cost $4 per unit and any
   additional units cost $2 per unit. What consumption bundle does Harmon choose?

   a) \( (x^*, y^*) = (12.5, 12.5) \)
   b) \( (x^*, y^*) = (25, 12.5) \)
   c) \( (x^*, y^*) = (12.5, 25) \)
   d) \( (x^*, y^*) = (15, 10) \)

7. Which of the following utility functions represent preferences of a consumer who
   does not have homothetic preferences?
   a) \( U(x, y) = xy \).
   b) \( U(x, y) = 3x + y \).
   c) \( U(x, y) = x + y^2 \).
   d) \( U(x, y) = \min\{x, y\} \).

8. Diana consumes commodities \( x \) and \( y \) and her utility function is \( U(x, y) = xy^2 \).
   Good \( x \) costs $2 per unit and good \( y \) costs $1 per unit. If she is endowed with 3
   units of \( x \) and 6 units of \( y \), how many units of good \( y \) will she consume?
   a) 4.
   b) 8.
   c) 10.
   d) 12.

9. If a consumer views a unit of consumption in period 1 as a perfect substitute (one
   for one) for a unit of consumption in period 2, and if the real interest rate is 0.1,
   the consumer will
   a) consume only in period 1.
   b) consume only in period 2.
   c) consume equal amounts in each period.
   d) consume more in period 1 than in period 2 if income elasticity exceeds 1,
      otherwise consume more in period 2 than in period 1.
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<td>經濟學系</td>
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※考生請於答卷卷內作答

10. Emily's expected utility function is \( p \sqrt{x_1} + (1 - p) \sqrt{x_2} \), where \( p \) is the probability that she has money \( x_1 \) and \( (1 - p) \) is the probability that she has money \( x_2 \). Emily is offered a choice between getting a sure payment of $1,600 or a lottery in which she receives $400 with probability \( p \) or $2,500 with probability \( (1 - p) \). Emily will choose the lottery if
   a) \( p < 0.33 \).
   b) \( p < 0.13 \).
   c) \( p > 0.5 \).
   d) \( p > 0.67 \).

二、(12分) 假設市場上只有四個人對於 x 商品有需求，分別是 A，B，C 和 D。

四個人個別對 x 商品的需求完全相同，都是：
   \[ x = \frac{1}{2} \frac{p_x}{p_y} \]

商品價格，\( p_x \) 是相關產品 y 的價格，I 是個人所得。

(Q1) 求出市場總需求函數。已知 \( p_x = p_y = 1 \)，且四個人的所得分別為：
   \( I_A = 25 \)，\( I_B = 64 \)，\( I_C = 70 \)。
   求出此時的市場總需求量。(4分)

(Q2) 承(Q1)，若 x 商品價格上漲成 \( p_x = 2 \) 新的市場需求量為多少？據此計算 x 商品的需求價格。(2分)

(Q3) 承(Q1)，若政府對 y 商品課以 300% 的從價稅，新的 x 商品市場需求量為多少？計算 y 商品價格變動影響 x 商品需求的交叉彈性，並說明 x 商品與 y 商品互為替代品或互補品。(3分)

(Q4) 承(Q1)，若四人當中，C 因離職所得減少 15，A 則因工作表現佳所得增加 11，新的 x 商品市場需求量為多少？說明消費者所得分配對於 x 商品需求的影響。(3分)

註：(Q2)、(Q3)、(Q4)彼此獨立。

三、(8分) 假設小明對於漢堡與果汁的效用可以函數表示：
   \[ U(x, y) = x^{0.5} y^{0.5} \]

其中\( x \) 為果汁數量，\( y \) 為漢堡數量。目前果汁價格 \( p_x = 25 \)，漢堡價格 \( p_y = 100 \)，小明每月預算 200 元。

(Q1) 求出可使小明達到效用極大的漢堡與果汁的最適消費數量。(4分)

(Q2) 假若果汁漲價 5 元成為 30 元，漢堡減價 20 元成為 80 元，請問小明消費果汁與漢堡的總效用會提高或降低？說明之。(4分)
四．(10分) 某一完全競爭市場有一萬個需求函數完全一樣的消費者與1,000家成本函數完全一樣的廠商。每一個消費者的需求函數是：\( Q(P) = 1 - 0.01P \)。

(1) 考慮廠商短期如下：
- 每一家廠商的短期成本是 \( F + 100 + Q^2 \)，其中 \( F \) 是固定成本，\( 100 + Q^2 \) 是變動成本

(Q1) 短期均衡價格為何？在短期每一家廠商該生產多少？(5分)

(2) 考慮廠商長期如下：
- 假設每一家廠商的長期成本是 \( 100 + Q^2 \)

(Q2) 完全競爭市場長期均衡價格為何？(5分)

五．(10分) A monopolist faces a demand curve given by \( Q(P) = 10P^{-1} \). Its cost function is \( c(Q) = 2Q \).

(Q1) What is its optimal level of output and price? (5分)

(Q2) The government is considering subsidizing the marginal costs of the monopolist. What level of subsidy should the government choose if it wants the monopolist to produce the socially optimal amount of output? (5分)

六．(30分) 考慮同一質產品雙寡占市場(DUOPOLY)。

- 市場需求是 \( Q(P) = 100 - P \)
- 廠商 1 的成本函數是 \( TC_1(Q) = 10Q \)，廠商 2 的成本函數是 \( TC_2(Q) = \frac{Q^2}{2} \)

(Q1) 若兩家廠商進行「數量競爭」，Cournot 均衡產量為何？(5分)

(Q2) 若兩家廠商進行「價格競爭」(若兩家價格一樣則平分市場)，此兩家廠商 Bertrand 均衡價格為何？(15分)

(Q3) 若廠商 1 是價格競爭性廠商(即廠商 1 先宣告價格，廠商 2 再根據廠商 1 所宣告的價格，決定其產量，廠商 1 的銷售量 = 市場需求量減去廠商 2 的產量)，請問廠商 1 的最適宣告價格為何？(10分)