A. Multiple Choices 單選題 (32 pts)

1. Which of the following statement is false about price elasticity in both the short run and long run?
   (a) The demand for non-durables is much more price elastic in the long run.
   (b) For durable goods, demand is more elastic in the short run.
   (c) More substitutes are usually available in the long run.
   (d) Point elasticity varies along the demand curve.
   (e) For durable goods, income elasticity is larger in the long run than in the short run.

2. Suppose the demand curve for $x$ is given by $Q^d = 10 - 2p_x + p_y$, where $p_x$ is the price of $x$ and $p_y$ is the price of a related good $y$. Which of the following is true?
   (a) Suppose $p_x = 1$, $p_y = 2$, the price elasticity of demand is $-0.2$.
   (b) $x$ is a normal good.
   (c) Suppose $p_x = 1$, $p_y = 2$, the cross-price elasticity of demand is $0.1$.
   (d) $y$ is a complement good for $x$
   (e) $y$ has a positive sloped Engel curve.

3. Which is not true for an optimal choice ($x^*$, $y^*$) of a consumer equilibrium?
   (a) ($x^*$, $y^*$) are demand functions and both are functions of $p_x$, $p_y$ and income $I$.
   (b) The MRS diminishes as an individual moves downward along the demand curve.
   (c) The level of utility increases as an individual moves downward along the demand curve.
   (d) A Corner solution is not optimal since $MRS \neq px/py$.
   (e) The marginal utility per dollar of expenditure is the same for each good.

4. Consider the following information about the choices that Jack makes. Which of the following is not true?

<table>
<thead>
<tr>
<th>Week</th>
<th>$x$</th>
<th>$y$</th>
<th>$p_x$</th>
<th>$p_y$</th>
<th>$I$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>40</td>
</tr>
<tr>
<td>2</td>
<td>6</td>
<td>14</td>
<td>2</td>
<td>2</td>
<td>40</td>
</tr>
<tr>
<td>3</td>
<td>20</td>
<td>10</td>
<td>2</td>
<td>2</td>
<td>60</td>
</tr>
</tbody>
</table>

   (a) $x$ and $y$ are both normal goods.
   (b) $x$ and $y$ are complement for Jack.
   (c) Jack’s utility decreases between week 1 and week 2.
   (d) Jack’s utility increases between week 2 and week 3.
   (e) Jack’s utility increases between week 1 and week 3.

5. Which of the following is not true for a monopoly market?
   (a) If $MC = 0$, the firm will produce at the point where the elasticity of demand is exactly $-1$.
   (b) With monopoly power, the monopolist can produce as many as it wants to make profit than that from a competitive market.
   (c) The monopoly usually set the price as a markup on its marginal cost and thus higher than its cost.
   (d) A monopolist can charge any price it wants.
   (e) The optimal rule to maximize profit via the $MR = MC$ for a monopoly firm is the same as in Competitive market.

6. Which is false about the cost functions in the short run and long run?
   (a) The U-shaped LAC curve is due to economy/diseconomy of scale when changing scale.
(b) MC crosses the AVC and AC curves at their minimum points in the short run.

(c) The law of diminishing marginal returns implies that marginal cost increases as output increases.

(d) Long run fixed cost curve is also decreasing.

(e) Sunk costs are costs that have been incurred and cannot be recovered.

8. Suppose that John’s utility function is given by \( U(I) = \sqrt{10 - I} \), where \( I \) is annual income in thousands of dollars. John earns an income \( I \) of 40 thousand with certainty year after year. Suppose he is offered a chance to take a new job that offers a 0.6 probability of earning \( I = 44 \), and a 0.4 probability of earning \( I = 33 \). Which of the following statements is not true?

(a) John is risk averse.
(b) The utility of his current salary is 20.
(c) The expected utility of the new job is 19.85, thus he should not take the job.
(d) John is willing to pay a risk premium to protect himself against the variable income associated with the new job.
(e) None of the above is true.

B. Synthesized Problems (18 pts)

1. Suppose an monopolistic firm with total cost function \( TC(Q) = Q^2 + 50 \) is facing the demand curve \( P = 40 - Q \). Answer the following questions.

(a) Find the profit maximizing output \( Q^* \), price \( P \) and profit. (3 pts)
(b) What would the equilibrium price and quantity be in a competitive market? Compute the deadweight loss due to monopoly. (5 pts)

2. Consider the following extensive-form game of production strategies between two cereal companies. (a) Find out the Nash Equilibrium for this game and explain why the concept of Nash Equilibrium fails to predict the outcome of this game. (5 pts) (b) What is the subgame perfect equilibrium of this game? (5 pts)

- **Diagram:**

```
   A
   /\  
 /   
Crispy  Sweet
  /\    /\ 
 /   /   
B  B
  /\  /\ 
/   /   
Crispy  Sweet
(10, 20) (20, 10) (5, -5) (5, -5)
```
C. 開答题（请依题序作答，未列算式、推理过程或适当说明者，不予计分）

1. 根据 Solow 成长模型，当某国的储蓄率增加时，在其他情况不变之下，其实质 GDP 的成长率会增加或减少？请先说明 Solow 成长模型的主要内容，再解释你的答案。（10%）

2. 根据恒常所得假说 (permanent income hypothesis)，请解释「国民年金」制度的施行，会对于台湾的消费支出造成什么影响？请先简短地说明恒常所得假说，再解释消费支出是否会有有所变化。（为简化分析，你可以假设其他条件不变。）（10%）

3. 货币供给成长率为 $\mu$，物价膨胀率为 $\pi$。假设实质货币需求函数可表示为：
\[
\frac{M^d}{P} = L(Y, R) = Y \cdot \psi(R)
\]
其中 $R$ 为名义利率，$Y$ 为实质 GDP。
   a) 实质 GDP 的成长率如果增加，则 $\mu$ 与 $\pi$ 之间的关系会发生如何的变化？请解释理由。（10%）
   b) 如果名义利率 $R$ 上升，则 $\mu$ 与 $\pi$ 之间的关系会发生怎样的变化？请解释原因。（10%）

4. 假设 $E$ 为新台币兑美元的汇率（新台币/美元，亦即 1 美元可兑换的新台币数额），$P^T$ 为台湾物价，$P^U$ 为美国物价：
   a) 请解释购买力平价（purchasing power parity, PPP）。 (5%)
   b) 如果购买力平价成立，在台湾物价膨胀率为 6%，美国物价膨胀率为 9% 时，$E$ 的变动率 ($\Delta E / E$) 是多少？请说明理由。（5%）