1. The TaiwanEcon Journal is considering offering a new service which will send news articles to readers by email. Their market research indicates that there are two types of potential users, impecunious undergraduates studying microeconomics and high-level executives. Let \( x \) be the number of articles that a user requests per year. The executives have an inverse demand function \( P_E(x) = 100 - x \) and the undergraduates have an inverse demand function \( P_U(x) = 80 - x \). The Journal has a zero marginal cost of sending articles via email.

(a) Suppose that the Journal can identify which of the users are undergraduates and which are executives. It decides to offer a plan where users can buy a fixed number of articles per year for a fixed price per year. If it wants to maximize total profit, what price and number of articles will be to undergraduates and executives? (10%)

(b) Consider the real world situation for this problem, you do think TaiwanEcon Journal’s pricing policy will work? Why? (5%)

2. (a) Define monopolistic competition. (5%)

(b) Why is it difficult or impossible to define the market demand curve, the market supply curve, and equilibrium price under monopolistic competition? (5%)

(c) Explain why the monopolist would never produce on the inelastic portion of the demand curve. (5%)

3. The game of “chicken” is played by two macho teens who speed toward each other on a single-lane road. The first to veer off is branded the chicken whereas the one who doesn’t turn gains peer group esteem. Of course, if neither veers, both die in the resulting crash. Payoffs to the chicken game are provided in the following table.

<table>
<thead>
<tr>
<th>A’s Strategies</th>
<th>B’s Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Chicken</td>
</tr>
<tr>
<td>Chicken</td>
<td>2, 2</td>
</tr>
<tr>
<td>Not Chicken</td>
<td>3, 1</td>
</tr>
</tbody>
</table>

a. Does this game have a Nash equilibrium? (5%)

b. Is a threat by either not to chicken-out a credible one? (10%)

c. Would the ability of one player to firmly commit to a not-chicken strategy (by, for example, throwing away the steering wheel) be desirable for that player? (5%)
4. Prof. DH buys a one-year government bond on January 1, 2001, for $500. He receives principal plus interest totaling $540 on January 1, 2002. Suppose that the CPI is 100 on January 1, 2001, and 110 on January 1, 2002. This increase in prices is more than DH had anticipated; his guess was that the CPI would be at 104 by the beginning of 2002. Find the nominal interest rate, the real interest rate, and DH's expected real interest rate. (10%) 

5. A large open economy has desired national saving of \( S^d = 20 + 200 r^W \), and desired national investment of \( I^d = 30 - 200 r^W \). The foreign economy has desired national saving of \( S^f_{for} = 40 + 100 r^W \), and desired national investment of \( I^f_{for} = 75 - 400 r^W \). Please calculate the equilibrium values of the real world interest rate \( r^W \), the domestic \( S, I \), and CA. (12%) 

6. Consider a closed economy with no government in which the per-worker production is \( y(k) = 6k^{0.5} \), where \( y \) is output per worker and \( k \) is capital per worker. The saving rate is 10%, the population growth rate is 10% per year, and the depreciation rate of capital is 5% per year. What are the steady-state values of the capital-labor ratio, output per worker, consumption per worker? (10%) 

7. Suppose the economy is characterized by the following equations:
   Desired consumption: \( C^d = 130 + 0.5(Y-T) - 500 r \)
   Desired investment: \( I^d = 100 - 500r \)
   Real money demand: \( L = 30 + 0.5Y - 1000i \)

   Where \( i \) is the nominal interest rate, expected inflation rate is \( \pi^e = 0.03 \), government purchase and taxes are equal at \( G = T = 100 \), nominal money supply is \( M = 1320 \), and full employment level is \( Y = 500 \).

   (1). Write the equations for IS and LM curves. (8 %)
   (2) Find the equilibrium values of the real interest rate and the price level. (6%)
   (3) What are the equilibrium values of the output, real interest rate, and the price level if the amount of taxes collected by the government is decreased to 50? (4%)