國立臺灣科技大學101學年度碩士班招生試題

系所組別： 企業管理系碩士班甲組、乙組

科　　目： 經濟學

（總分為100分）

1. There is a dairy farmer who produces 60 pounds of cheese a week. Initially the price of cheese (P) is $3 a pound, so his income (M) is $180 a week. Suppose his demand function for cheese (X), for his own consumption, is $X = 10 + M/(10P)$. His initial demand for cheese is therefore 16 a week. Now suppose that the price of cheese falls to $2 a pound. Please calculate
   (1) the substitution effect; (5 points) and
   (2) the income effect caused by the change of the price of the cheese. (5 points)

2. A monopoly firm's production has the Cobb-Douglas form $Q = L^{0.5}K^{0.5}$. Suppose the demand function for the firm's product is $P = 100 - Q$. The input prices are $P_L = 4$ and $P_K = 1$.
   (1) Derive the total cost function and total revenue equations. (5 points)
   (2) Find the profit-maximizing output (5 points).
   (3) Find the optimal input employments L* and K*. (5 points)
   (4) What is the maximizing Profit? (5 points)

3. Suppose demand is described by the equation $P = 300 - Q$. The long-run supply curve is $Q = P/2 - 30$, and the short run supply curve is $Q = 36 + P/5$. It can be shown that the market is in the long-run and short-run equilibrium at quantity $Q^0 = 80$ and $P^0 = 220$. Now suppose the demand curve shifts to the right, becoming $P = 420 - Q$.
   (1) What happens in the immediate run? (5 points)
   (2) What is the new short-run price-quantity equilibrium? (5 points)
   (3) What is the new long-run equilibrium? (5 points)
   (4) What would be the perceived "shortage" if a price ceiling prevented price from rising above its initial level $P^0 = 220$? (5 points)

4. In a country called Econland, there are 10 people. Their incomes (in thousands) are *$8, $1.5, $30, $12, $2, $16, $9, $20, $10, $15*. From the data, please
   (1) plot a Lorenz Curve; (5 points) and
   (2) calculate the Gini Coefficient. (5 points)

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5. Suppose the monetary policy curve is $r = 1.5 + 0.75\pi$, and the *IS* curve is $Y = 13 - r$; where Y is total output, r is real interest rate and π is inflation rate.

(1) Calculate the aggregate demand (AD) curve. (10 points)

(2) What is the responsiveness of the real interest rate to the inflation rate? Is this monetary policy curve consistent with the so-called "Taylor Principle"? (5 points)

(3) Suppose that the U.S. economy does not recover from the 2007 contraction until 2012, when a new Fed chairperson is appointed. Suppose his or her approach to monetary policy can be summarized by the following statement: "I care only about increasing employment; inflation has been at very low levels for quite some time; my priority is to ease monetary policy to promote employment."

a. Would you expect the monetary policy curve to shift upwards or downwards? (3 points)

b. What would be the effect on the AD curve? (2 points)

6. Assuming Okun's law is given by $(U - U_n) = -0.75(Y - Y_p)$ and that the Phillips curve is given by $\pi = \pi^e - 0.6\,(U - U_n) + \rho$ (where U = actual unemployment rate; U_n = Natural rate of unemployment; Y = actual output; Y_p = potential output; π = inflation rate; π^e = expected inflation rate; and ρ = supply shock (price) factor).

(1) Calculate the short-run aggregate supply (AS) curve if expectations are adaptive, inflation rate was 3% last year, and potential output is *$10* trillion and assume there has no supply shocks in either direction. (10 points)

(2) if there is a supply shock such that $\rho = 2$ and ceteris paribus, what would happen to the inflation rate? (5 points)

(3) During the spring of 2010 the US Fed officials discussed the possibility of increasing interest rates as a way of fighting potential increases in expected inflation. If the public came to expect higher inflation rates in the future, what would be the effect on the short-run AS curve? Show your answer graphically. (5 points)