NATIONAL UNIVERSITY OF SINGAPORE

EC2102 MACROECONOMIC ANALYSIS I

(SEMESTER I : AY2006-2007)

Time Allowed : 2 Hours

INSTRUCTIONS TO CANDIDATES

1. This examination paper contains 4 questions and comprises 6 printed pages, including two figures, Figures 1 and 2. This front page counts as page 1.

2. ALL questions are compulsory. The total number of points is 100.

3. This is a CLOSED BOOK examination.

4. Write your answers in the exam booklets provided only.

5. Write your matriculation number, your tutorial group number and/or your tutorial time slot on each exam booklet used. Number all the exam booklets used.

6. On the front page of the first exam booklet, write down how many exam booklets you used, and write down the order in which the questions were answered.

Question 1 (20 points)

Consider an economy with an infinitely-lived representative firm which is owned by an infinitely-lived representative consumer. There is h units of time each period, but the representative consumer values consumption only, and NOT leisure. The representative consumer has a discount factor of β, where $\beta \in (0,1)$. The representative firm has a production technology of $Y_t = z_t F(K_t, N_t)$, $t = 1, 2, ...$, where z_t, K_t, and N_t are period t's productivity (TFP), capital stock and employment respectively. The real rate of interest in time period t is r_t. Let w_t be the wage rate per unit of time worked in time period t. There is no government in this economy.

(i) Write down the representative consumer and the representative firm's maximization problems in time period t. What are their respective First Order Conditions. (14 points)

(ii) Define a competitive equilibrium for this economy. (6 points)

Question 2 (30 points)

Let us consider the real intertemporal model studied in class, where all prices are fully flexible. Suppose that the economy is initially in an equilibrium. Equilibria in the labour and goods markets in time period 1 are illustrated in Figure 1.

(*i*) Now suppose that the economy is hit by a negative TFP (Total Factor Productivity) shock at the beginning of time period 1. This TFP shock is persistent, though it dies down over time. With the aid of graphs, illustrate the impact of this on equilibria in the labour and goods markets in time period 1, as well as on decisions made by the representative consumer and the representative firm in time period 1. (25 points)

(*ii*) From your analysis above, compare the predictions of this model to the data:

Variable	**Data**	
Consumption	Procyclical	
Investment	Procyclical	
Price Level	Countercyclical	
Money Supply	Procyclical	
Employment	Procyclical	
Real Wage	Procyclical	
Average Labour Productivity	Procyclical.	(5 points)

Question 3 (20 points)

In the Keynesian sticky (nominal) wage model, suppose that the economy in time period 1 is initially as described in Figure 2: the real output is $\widehat{Y}_1$, the real rate of interest is $\widehat{r}_1$, the price level is $\widehat{P}_1$, and the fixed nominal wage in time period 1, $\overline{W}_1$, is such that the implied real wage in time period 1, $\widehat{w}_1$, where $\widehat{w}_1 = \overline{W}_1/\widehat{P}_1$, is above the market clearing real wage in the labour market.

Suppose that the government spends G_t and taxes T_t in real terms in time period t. The government is also the central bank; the supply of money in time period t is M_t.

Now suppose that the government announces that it will increase its spending permanently by Δ, starting from time period 1. All announcements made by the government are credible and known to the public.

Explain the impact of this change in government expenditures, in time period 1, with the aid of graphs.

Question 4 (30 points)

You believe in the Keynesian sticky (nominal) wage model.

You are having a conversation in a café with your Neoclassical friends who are trying to convince you about the neutrality of money. How would you convince them money is not neutral, even today (time period 1)?

You want to illustrate your argument with the aid of graphs, and explain carefully your reasoning. Since your Neoclassical friends are unfamiliar with the Keynesian sticky (nominal) wage model, you want to use Figure 2, in addition to today's money market, in your explanation.

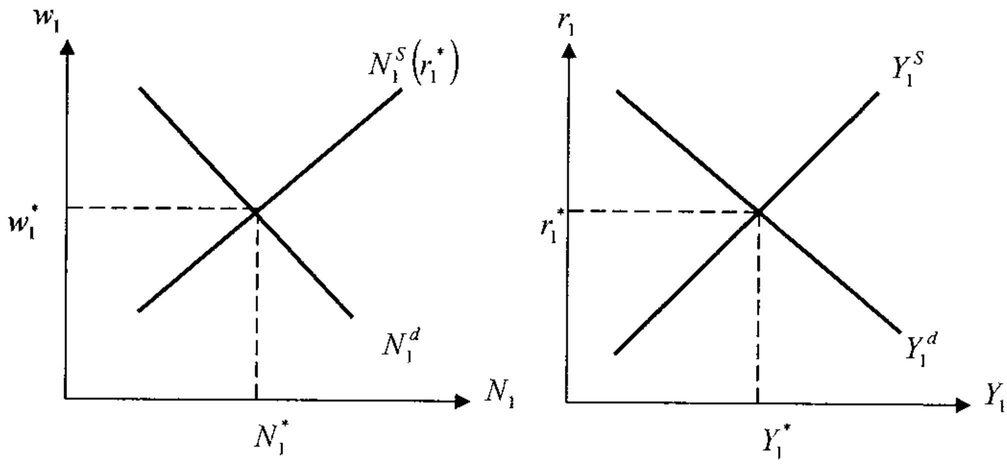

Figure 1

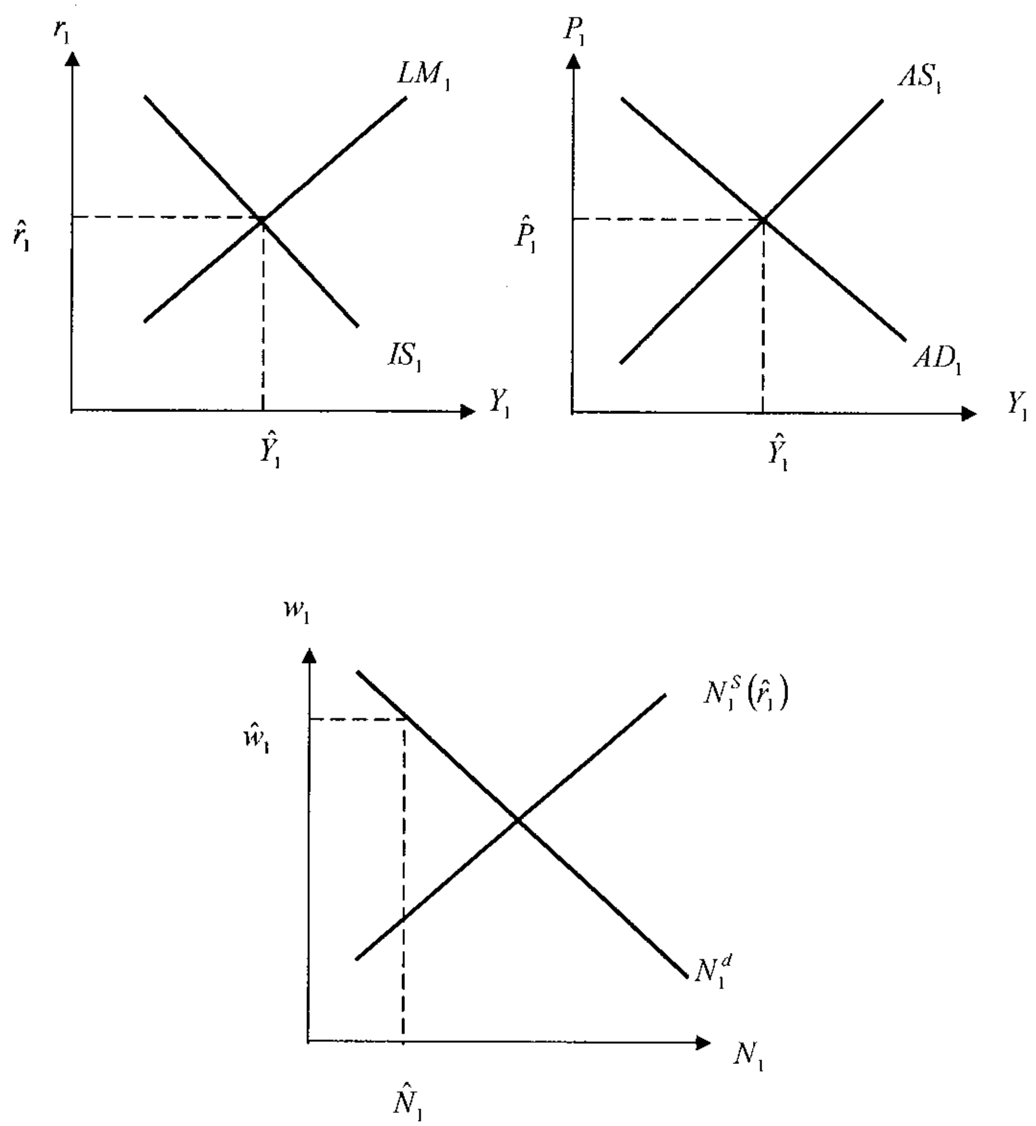

Figure 2

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