ISCTE–IUL, Exam, Macroeconomics I, January 2016.

ISCTE — INSTITUTO UNIVERSITÁRIO DE LISBOA

MACROECONOMICS – I

Exam

January– 2016 **Duration: 2 hours**

Group A — Price Indexes (40 points)

Consider the following Table and the information about the quantities produced and the prices of goods Y and X.

	2017	2018	2019
Quantity of *Y*	100	105	103
Quantity of *X*	5	3	4
Price of *Y*	\$5	\$5	\$5
Price of *X*	\$100	\$105	\$110

1. Calculate the value of nominal GDP for 2017 and 2018 years, and the growth rate for that period.
2. Calculate the value of real GDP for the same years, using the following price indexes: Laspeyres, Paasche, and Fisher. (Formulas given below)
3. What is the growth rate of real GDP according to each one of the three indexes?
4. What are the major limitations of the conventional way of measuring real GDP, by using this type of fixed base year indexes? Explain.

$$\textit{Paashe Index } P_t^{\mathcal{P}}: \qquad P_t^{\mathcal{P}} = \frac{\sum_{i=1}^{j} Q_{i(t)} \times P_{i(t)}}{\sum_{i=1}^{j} Q_{i(t)} \times P_{i(\mathbf{0})}}$$

$$\textit{Laspeyres Index } P_t^{\mathcal{L}}: \qquad P_t^{\mathcal{L}} = \frac{\sum_{i=1}^{j} Q_{i(0)} \times P_{i(t)}}{\sum_{i=1}^{j} Q_{i(0)} \times P_{i(0)}}$$

$$\textit{Fisher index } P_t^{\mathcal{F}}: \qquad P_t^{\mathcal{F}} = \sqrt{P_t^{\mathcal{P}} \cdot P_t^{\mathcal{L}}}$$

Group B — The IS function (60 points)

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Consider a certain economy, the demand side of which can be characterized by the following setting of equations:

$$\begin{aligned} C_t &= 0.7\bar{Y}_t \\ G_t &= 0.15\bar{Y}_t \\ EX_t &= 0.05\bar{Y}_t \\ IM_t &= 0.06\bar{Y}_t \\ I_t &= [0.16 - 2(R_t - \bar{r})]\,\bar{Y}_t \end{aligned}$$

where $\bar{Y}_t$ is the level of potential GDP, R_t represents the real interest rate, and $\bar{r} = 4\%$ is the Marginal Productivity of Capital. The remaining symbols represent each individual aggregate on the demand side (Consumption, Government Expenditures, Exports, Imports and Investment).

1. Obtain the expression of the IS function and represent it graphically. If $R_t = 3\%$, what will be the level of the output gap (short term output)?
2. What happens to the output gap if the government increases public spending by 3 percentage points? Represent graphically.
3. Considering the initial situation, what happens to the output gap if the central bank increases the short term interest rate by 2 percentage points? Represent graphically.
4. Considering the initial situation, what happens to the output gap if $\bar{r}$ increases to 6%? Represent graphically.
5. Considering the initial situation, what happens to the output gap if the government increases public spending by 3 percentage points and Consumption depends also on the output gap ($\tilde{Y}_t$) as follows

   $$C_t = \left(0.7 + 0.5\tilde{Y}_t\right)\bar{Y}_t$$

   Represent graphically.

Group C — The Great Recession & Short-Run Model (60 points)

C1. (30 points) Suppose housing prices had been rising, but then they fall sharply. This decline produces a negative shock upon investment and aggregate demand, causing the IS function to shift downwards as in the following figure.

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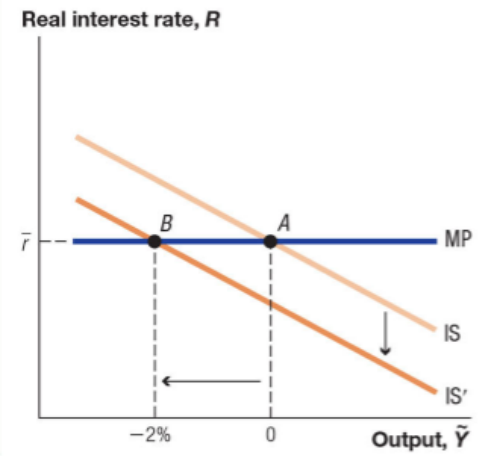

1. Explain what the Central Bank should do in order to stabilize output at its long term equilibrium. Use graphical analysis in your answer.
2. What are financial frictions and how they affect the working of our macroeconomy?
3. Using the figure above, explain what happens if there is a large financial friction (spread) in the economy, and the central bank tries to get the economy back to $\tilde{Y} = 0$.

C2. (30 points) — Consider the following Table, which corresponds to the balance sheet of the bank NO LIMITS**:**

Column A		**Column B**	
Loans	12000	Deposits	13000
Financial Investments	8000	Short Term Debt	5000
Cash & Reserves	500	Long Term Debt	1000

Taking into account the information above, answer the following questions:

1. What is the total amount of liabilities of this bank, as well as the total amount of net equity.
2. If the reserves requirements rate is 5%, and the ratio of capital requirements is 10%, how do you describe the situation of the bank as far as liquidity and solvability is concerned?
3. What is the leverage ratio of this bank? What does this ratio tells us about the level of risk this banking is taking?
4. Rewrite the balance sheet in the case 20% of the loans will not be paid back. What is the situation of the bank if that happens?

Group D — Stabilization in the AS/AD framework (40 points)

(40 points) Consider the standard macroeconomic model discussed in the textbook. It includes the three fundamental equations: an aggregate demand function (AD), a monetary policy rule (MP), and an aggregate supply function (AS). Having the following information:

$$\begin{aligned} IS &: \tilde{Y}_t = \bar{a} - \bar{b}(R_t - \bar{r}) \\ MP &: R_t = \bar{r} + \bar{m}(\pi_t - \bar{\pi}) \\ AS &: \pi_t = \pi_{t-1} + \bar{v}\tilde{Y}_t + \bar{o}. \end{aligned}$$

1. Obtain the Aggregate Demand function.
2. Knowing that $\bar{a} = 0, \bar{r} = 3\%, \bar{\pi} = 2\%, \bar{o} = 0$, what are the values of both the real interest rate and the inflation rate such that the economy is in its long term equilibrium?
3. Represent graphically such equilibrium.
4. Consider that the economy initially is in its long term equilibrium and is hit by an external oil supply shock, which decreases increases $\bar{o}$ by 5 percentage points. Knowing that $\bar{v} = 0.5$, what will be the next period inflation rate? Is this level of inflation stable over time? Explain using graphical analysis.

END OF TEST.