

ECO2142 Macroeconomic Theory I  
Midterm II

**Problem 1: Micro-foundation of Unemployment (10 points)**

Many microeconomic models have presented rational arguments explaining the presence of unemployment in a market economy.

- a) Give the intuition underlying Shapiro and Stiglitz's shirking efficiency wage model. (5 points)
- b) Give the intuition underlying Salop's labor turnover efficiency wage model. (5 points)

**Problem 2: The Macroeconomic Equilibrium (30 points)**

- a) Let  $L$  be the quantity of labor and  $Y$ , be total production. Assume that we can represent the production sector by a representative competitive firm (i.e. a price taker firm) with a production function  $Y = f(L)$ . Explain graphically how the demand for labor,  $L^d(w/P)$ , is obtained for this economy. (5 points)
- b) Assume that labor supply is given by an increasing function  $L^s(w/P)$ . Explain graphically how an equilibrium is obtained on the labor market if this market is competitive and without nominal rigidity. (5 points)
- c) Explain in your own words the consequence of Fischer's assumption that the labor market is characterized by the presence of labor contracts with fixed nominal wages. (5 points)
- d) Assume now that in the presence of "à la Fischer" labor contracts, the quantity of labor is determined by labor demand. Explain graphically how the aggregate supply ( $AS$ ) is determined in this economy. (5 points)
- e) Explain how the aggregate demand ( $AD$ ) in the economy is obtained from the  $IS - LM$  model. (5 points)
- f) Show graphically how the macroeconomic equilibrium is determined in this  $AD - AS$  model. (5 points)

**Problem 3: Macroeconomic Policies (40 points)**

Consider an economy that produces initially (at  $t = 0$ ) at its natural level  $Y_0 = Y_n$ . Assume that  $P_t^e = P_{t-1}$ .

- a) Suppose that the government wishes to reduce the public deficit. The government has two options: a reduction of public spending or an increase in the tax rate on income. Compare the impact of those two options in the short run and in the medium run. *Assume that public spending has no impact on the production sector or on the labor market.* (20 points)
- b) Consider an increase of money supply  $\Delta M^s$  that has exactly the same short run impact on total production than an increase in government spending  $\Delta G$ . Compare the short run and medium run impacts of those two policies on total production  $Y$ , the price level  $P$ , on the interest rate  $i$  and on private investment  $I$ . (20 points)

**Problem 4: The Phillips Curve (20 points)**

Consider the following Phillips curve:

$$\pi_t = \pi_{t-1} + 0.18 - 3u_t.$$

- a) What is the NAIRU,  $u_n$ , for this economy? (5 points)
- b) *Assume that inflation at  $t - 1$  was 0.* At period  $t$ , the government decides to reduce unemployment to 5% and to maintain this level of unemployment. What will be the inflation rates for  $t$  and  $t + 1$ ? (5 points)
- c) *Assume now that 30% of wages are indexed to inflation in this economy.* What is the new Phillips curve? (5 points)
- d) Using this new Phillips curve, what would be the inflation rates for  $t$  and  $t + 1$ . (5 points)