



**Strathmore Institute of Mathematical Sciences (SIMS)**  
**Bachelor of Business Science in Financial Economics/Financial**  
**Engineering**  
**End of Semester Examination**  
**BSE 2208: Macroeconomics II**

DATE: 5th December, 2022

Time: 2 Hours

Instructions

- This examination consists of FIVE questions.
  - Answer Question ONE (COMPULSORY) and any other TWO questions.
1. (a) Consider the following Neoclassical model of the economy, where  $r$  is in percentage terms.

Supply	Demand
$Y = F(K, L) = 10\sqrt{KL}$	$C = 260 + 0.8(Y - T)$
$MPL = ?; MPK = 5\sqrt{L/K}$	$I = 230 - 5r$
$K = 400; L = 100$	$G = 100, T = 200, NX = 0$

- (i) Calculate the income that goes to workers and owners of capital. Show your work. **(4 Marks)**.
  - (ii) How much are households saving? How much is the government saving? **(2 Marks)**
  - (iii) Find the interest rate that produces equilibrium in either the goods market or the loanable funds market. **(3 Marks)**
- (b) The country of Oceania is a small open economy. Suddenly, a change in world fashions makes the exports of Oceania unpopular. Briefly explain what happens in Oceania to saving, investment, net exports, the interest rate, and the exchange rate. **(6 Marks)**
- (c) Suppose that there is a rumor of a computer virus that will attack commercial banks' Automatic Teller Machines (ATMs). Briefly, but intuitively explain how this event will affect the monetary base, the money multiplier, and the money supply. **(4 Marks)**

- (d) According to the IS-LM model, explain the impact of an increase in taxes on the interest rate, income, consumption, and investment. **(5 Marks)**
- (e) Explain two ways in which a recession might raise the natural rate of unemployment **(6 Marks)**
2. Consider the following Neoclassical model of the economy, where the domestic interest rate  $r$  and the world interest rate  $r_*$  are in percentage terms.

Supply, Money, and Prices	Demand
$Y = F(K, L) = 10\sqrt{KL}$	$C = 75 + \frac{1}{2}(Y - T)$
$K=100; L=25$	$I=150-4r$
$r_* = 5\%$	$G = 50, T = 50$
$P = 100, P_* = 110; M = 1000$	$NX = 50 - 2\epsilon$

- (a) Calculate the trade balance and net capital outflow for the small open economy. Show the trade balance on a saving-investment diagram with  $r$  measured on the vertical axis. What are the equilibrium real exchange rate ( $\epsilon_*$ ) and equilibrium nominal exchange rate ( $e_*$ )? Provide an interpretation of both  $\epsilon_*$  and  $e_*$ . **(8 Marks)**
- (b) Consider the following all-too-realistic scenario: a global pandemic reduces the labor force from  $L = 25$  to  $L = 16$ . What does this do to the equilibrium real exchange rate ( $\epsilon_*$ ) and the trade balance in the small, open economy? Show your results in a diagram with  $\epsilon$  on the vertical axis and (NX and/or  $S - I$ ) on the horizontal axis. **(4 Marks)**
- (c) Assuming the velocity of money is constant, what money supply should the central bank target to achieve a 0% inflation (i.e., stable price level) given the pandemic? In words, how would the central bank achieve the new monetary target? **(5 Marks)**
- (d) Parliament is hoping to get the economy back to its pre-pandemic level of GDP. For the model above, what level of government spending,  $G$  will achieve that? **(3 Marks)**
3. (a) Assume that currency (C) is \$10 billion and reserves (R) are \$20 billion, the reserve-deposit ratio is 0.1, and the currency-deposit ratio ( $cr$ ) is 0.05.
- (i) what is the amount of demand deposits? what is the money supply? Show your work. **(4 Marks)**
- (ii) Assume that the velocity of money is constant and real GDP growth is 2.5%. The Central Bank is targeting a 2% inflation rate. What is the target growth rate in the money supply? How much new money needs to be injected in the coming year to meet the target? Explain. **(5 Marks)**
- (iii) National savings is 200 and investment is  $I = 250 - 10r$ , where  $r$  is the real interest rate. Assuming the Central Bank hits the target inflation rate, what is the nominal interest rate? **(3 Marks)**

- (iv) The economy suddenly falls into recession and real GDP growth falls to -1%. How should the Central Bank change the money growth to maintain the 2% target for inflation? **(2 Marks)**
- (b) In each of the following scenarios, explain and categorize the cost of inflation.
- (i) Because inflation has risen, Jade Collections company decides to issue a new catalog monthly rather than quarterly. **(3 Marks)**
- (ii) Maria lives in an economy with hyperinflation. Each day after being paid, she runs to the store as quickly as possible so she can spend her money before it loses value. **(3 Marks)**
4. (a) A small open economy is described by the following equations:

$$C = 50 + 0.75(Y - T)$$

$$I = 150 - 10r$$

$$\left(\frac{M}{P}\right)^d = Y - 50r$$

$$G = 250$$

$$T = 200$$

$$M = 3000$$

$$P = 4$$

- (i) Derive the *IS* and *LM* curves **(4 Marks)**
- (iii) What are the equilibrium level of income and the equilibrium interest rate? **(3 Marks)**
- (b) Suppose that higher income implies higher imports and thus lower net exports. That is, the net-exports function

$$NX = NX(e, Y)$$

Examine the effects in a small open economy of a fiscal expansion on income and the trade balance under the following exchange-rate regimes.

- (i) A floating exchange rate **(4 Marks)**
- (ii) A fixed exchange rate **(4 Marks)**
- (c) Describe the concept of impossible trinity as used in open macroeconomics. **(5 Marks)**
5. (a) Explain the two theories of aggregate supply. On what market imperfection does each theory rely? What do the theories have in common? **(8 Marks)**
- (b) (i) Assume that OPEC starts enforcing oil production quotas and the global supply of oil declines. As a result, energy prices start to increase. This causes the costs of production for Kenyan firms to increase. Use the AD-SRAS-LRAS diagram to describe the transition of the macroeconomy from the short run to the long-run without government intervention **(7 Marks)**

- (ii) Now assume the Central Bank (CB) and parliament are concerned about future inflation, output and unemployment. Describe in words, using the AD-SRAS-LRAS diagram as a guide, the possible stabilization strategy for parliament and CB. In particular, discuss the tradeoffs they face. **(5 Marks)**

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