Strathmore
UNIVERSITY

Strathmore Institute of Mathematical Sciences
BBS FIN/FE
END OF SEMESTER EXAMINATION
(MACROECONOMICS II: BSE 2206)

DATE: 13th November 2018 Time: 2 Hrs

Instructions

- **Answer Question ONE(COMPULSORY) and any other TWO questions**

1. (a) Consider the following model:

$C = C + G + I;$	$C = c_0 + c_1 Y_D$
$T = 50$	$G = 150$
$I = 100$	
with $c_0 = 10$ and $c_1 = 0.5$.	

   (i) Compute equilibrium income, consumption and private savings.(**4 Marks**).

   (ii) Suppose the government asks consumers to save more. The consumers abide and reduce c_0 by 5. What happens to equilibrium income and private consumption? Explain the intuition.(**4 Marks**).

   (b) Suppose that the Quantity Theory of Money holds perfectly in Equationville. Over the past year, money supply in Equationville changed by a factor of 1.22, velocity of circulation was halved, and output increased by a factor of 4. By what factor did the price level change? (**3 Marks**).

   (c) Using Solow model of economic growth, explain what happens to steady-state capital per worker and the income per worker in response to each of the following exogenous changes.

   (i) A change in weather patterns increases the depreciation rate.(**3 Marks**).

   (i) Better birth-control methods reduce the rate of population growth.(**3 Marks**)

   (d) Using the IS-LM model predict the short-run effects of each of the following shocks on income, the interest rate, consumption and investment:

   (i) After the invention of a new high-speed computer chip, many firms decide to upgrade their computer systems **(4 Marks)**

(ii) A best seller titled *Retire Rich* convinces the public to increase the percentage of their income devoted to saving **(4 Marks)**

(e) Suppose we have found a small open economy with perfect capital mobility. If consumers in the country experience a permanent preference shift towards increased consumption (at any level of income), what happens to the long run equilibrium real exchange rate and the real world interest rate? **(5 Marks)**

2. (a) In Assumptionland currency (C) is \$500 billion and bank reserves (R) are \$2 trillion. The minimum allowable reserve requirement set by the Central Bank is 10% of deposits;

i). What is the money supply if banks lend the maximum allowable and households do not hold any cash **(5 Marks)**

ii). What is the money supply if households decide to hold 20% of deposits in the form of cash **(3 Marks)**

iii). What is the money supply if banks become cautious about lending, and even though the minimum reserve requirement by law remains at 10%, banks decide to hold back 20% of deposits in reserves? Assume households still hold 20% of deposits as cash **(3 Marks)**

iv). The Central Bank wishes to increase the money supply the money supply by 10%. Carefully describe two methods for doing this using the multiplier in part (i) **(4 Marks)**

(b) You read in an economist magazine that the nominal interest rate is 12 percent per year in country F (foreign country) and 8 percent per year in country H (home country). Suppose that the real interest rates are equalized in the two countries and that purchasing-power parity holds. Using the Fisher equation, what can you infer about expected inflation in country F and in country H respectively? **(5 Marks)**

3. (a) Consider the recent Bonn climate talks. Assume countries agree to a 1.5C maximum increase in average global temperatures by reducing the amount of carbon emissions from manufacturing firms. Use the AD-SRAS-LRAS model to show graphically how this will impact a macroeconomy in the short and long-run. Label your initial equilibrium "A", short-run equilibrium "B", and the long-run equilibrium "C". Explaing the transition of the economy and how a central bank could use monetary policy to counteract the climate policy **(10 Marks)**

(b) In the context of Mundell-Fleming model, explain what is meant by concept of the "impossible trinity" **(10 Marks)**

4. (a) Consider two countries : Frugalia and Prodigalia (we will call them F and P). In both countries the production function is Cobb-Douglas: $Y = AK^{\frac{1}{3}}N^{\frac{2}{3}}$. Where A denotes the total factor productivity, K is physical capital, and N is labor. The population growth rate is 0.1, physical capital depreciates at the rate of 0.1 and $A = 1$. In F the savings rate is $s_F = 0.2$ and in P it is $S_P = 0.4$

(i) Write the production function in terms of output per capita (Y/N) **(2 Marks)**

(ii) Find the steady state values of the capital-labor ratio (K/N) in both countries **(4 Marks)**

(iii) Find the steady state values of the output per capita (Y/N) in both countries **(2 Marks)**

(iv) In which of the countries is consumption per capita higher in steady state?**(3 Marks)**

(v) In which of the countries is the marginal product of labor higher in the steady state? **(3 Marks)**

(b) Consider a Cobb-Douglas production function with three inputs, K is capital (the number of machines), L is labor (the number of workers), and H is human capital (the number of degrees among the workers). The production function is

$$Y = K^{1/3}L^{1/3}H^{1/3}$$

(i) Derive an expression for the marginal product of labor. How does an increase in the amount of human capital affect the marginal product of labor? **(2 Marks)**

(ii) An unskilled worker earns the marginal product of labor, whereas a skilled worker earns the marginal product of labor plus the marginal product of human capital. Using the given production function, find the ratio of the skilled wage to the unskilled wage. **(4 Marks)**

5. (a) Let the following represent a small open economy with perfect capital mobility and flexible exchange rates;

Goods market	Financial market
Goods demand: $AD = C + I + G + NX$	Money supply: $\frac{M^s}{P} = 60$
Consumption: $C = 80 + 0.6Y_D$	Money demand:$\frac{M^d}{P} = 0.2Y - 4r$
$Y_D = Y - T$	
Investment: $I = 70 - 10r$	
Taxes: $T = 60$	
Government exp: $G = 84$	
Net Exports: $NX = 100 - 0.1Y - 24E$	

(i) Assume that initially foreign and domestic interest rates be equal so that $r = r^f$ and let the foreign exchange rate E equal 2. Find the IS and LM equations (**4 Marks)**

(ii) Find the equilibrium income, interest rate and net exports(**2 Marks)**

(iii) The Central Bank thinks that Y is too high and reduces real money supply from 60 to 56 in order to reduce GDP. Find the new equilibrium values of Y, e, and NX. **(5 Marks)**

(iv) After the Central Bank's intervention in (iii), the government thinks that (as a result of this intervention) NX is too low. Inorder to increase NX, the government reduces spending by 10 to 74. Find the new equilibrium values of Y, e, and NX after this reduction in G (assuming that M^s/P is stillat 56).**(5 Marks)**

(b) ii. In the Mundell-Fleming model with a floating exchange rate, what happens to aggregate income, the exchange rate, and the trade balance when the world interest rate rises? Illustrate your answer with a well labeled graph. **(4 Marks)**

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