ECONOMICS TRIPOS PART I

MOCK EXAMINATION 2020

Paper 2 MACROECONOMICS - 3 HOUR EXAMINATION

Answer **ALL SIX** questions from Section A and **TWO** questions from Section B.

Section A and B will each carry 50% of the total marks for this paper.

Students are permitted to use an approved calculator.

SECTION A *Answer all six questions from this Section*

1. Let K denote aggregate capital and L aggregate labour. What are the two key assumptions that define a neoclassical production function $F(K, L)$? Provide a brief interpretation for each of them.

2. Consider an economy described by the Solow growth model, with a production function $F(K, L) = 2K^{1/3}L^{2/3}$. The capital depreciation rate is 10% and the saving rate is 38.5%. Population grows at a rate 1%.
   (a) What is the steady state output per worker in this economy?
   (b) Is the economy dynamically efficient or inefficient? Explain.

3. What is hyperinflation? Describe two economic consequences of hyperinflation.

4. Explain how the following are affected by a decrease in the world real interest rate, for a small open economy with fixed prices, free capital mobility and a floating exchange rate: aggregate income, consumption, investment and net exports.

5. In a world with perfect capital mobility and flexible prices, would you expect poorer countries to run trade surpluses or deficits? Explain your reasoning carefully.

6. In the context of monetary policy, what is meant by the 'Friedman rule'?

SECTION B *Answer only two questions from this Section*

7. Consider a closed economy where there is a constant number of units of capital, $\bar{K} = 100$. There is also a constant population of $\bar{N} = 100$ people. Of those, $L = 90$ people form the labour force and in a given month $E = 81$ people are employed while $U = 9$ are unemployed. The aggregate production function is given by $F\left(\bar{K}, E\right) = \bar{K}^{1/2}E^{1/2}$.

   (a) What is the unemployment rate in this economy? What are the output per capita and total output produced in a year?

   Now suppose that five of the nine unemployed people become discouraged and stop looking for work, while the other four remain unemployed. Moreover, three of the employed people lose their jobs and become unemployed.

   (b) What is the new unemployment rate? What are the new output per capita and total output? Comment.

   (c) In light of your answers in part (a) and (b), describe two policies that the government of this economy could implement in order to improve the well-being of its population. Explain your reasoning.

8. The table below shows data taken from the Bank of England database, for 2019.
Column A: *Monthly changes of total sterling notes and coin in circulation outside the Bank of England (in £ sterling millions) not seasonally adjusted.*
Column B: *Monthly changes in monthly average of amounts outstanding of Bank of England Banking Department £ sterling reserves balance liabilities (in £ sterling millions) not seasonally adjusted.*
Column C: *Monthly changes of M4 (monetary financial institutions' sterling M4 liabilities to private sector) (in £ sterling millions) not seasonally adjusted.*

	A	B	C
Jan 2019	1219	-6162	-5278
Feb 2019	-277	984	25360
Mar 2019	-209	12785	7491
Apr 2019	-118	-13607	11427
May 2019	462	-1406	20314
Jun 2019	650	-3501	12522
Jul 2019	367	-2694	4337
Aug 2019	58	3438	-1708
Sep 2019	740	13947	15327
Oct 2019	207	-15483	7527
Nov 2019	-1143	2693	9794
Dec 2019	-1556	2057	-15470

Suppose that the Bank of England estimates that during 2019 the currency-deposit ratio has been approximately 0.1% and the reserve-deposit ratio has been approximately 7%.

(a) What is the estimated money multiplier?
(b) Using the data from the table and the estimated money multiplier, calculate the approximate total change in money supply from January 2019 to December 2019, in £ sterling millions.
(c) Use your estimated change in money supply from part (b) and the M4 data given in column C of the table to comment on whether the Bank's estimated money multiplier and M4 are good approximations of the true money multiplier and total money supply respectively.

9. Consider a closed economy with a fixed current price level and no government. The components of aggregate expenditure are described by the following equations:

$$\begin{aligned} C &= \bar{C} + cY, \\ I &= a - b\left(r + r^e\right), \end{aligned}$$

where Y is aggregate income, C is consumption, I is investment, r is the current short-term real interest rate, and r^e is a measure of the expected future short-term real interest rate. a, b, c and $\bar{C}$ are fixed positive parameters. The current short-term real interest rate is set by the central bank, according to the rule:

$$r = \overline{r} + m_\pi \pi,$$

where π is the current rate of inflation, and $\overline{r}$ and m_π are fixed positive parameters.

(a) Explain briefly why the investment function might take this form.

(b) Derive an algebraic expression for the aggregate demand curve in this economy, under the assumption that r^e is an exogenous constant.

Now suppose that a zero lower bound on the short-term nominal interest rate prevents r from falling below some value $r_{\min}$. That is:

$$r \geq r_{\min}$$

There is no such restriction on r^e.

(c) Explain algebraically and graphically how 'forward guidance' regarding the future short-term real interest rate might substitute for conventional monetary policy, when the lower bound on r is binding.

(d) What factors might affect the success of this 'unconventional' monetary policy strategy?

10. Using aggregate supply - aggregate demand analysis, analyse the likely short-run and long-run implications of the following:

    (a) An increase in consumption taxes.
    (b) A major virus pandemic.

END OF PAPER