

Master of Arts Examination 2019
1st year, 2nd sem
Macroeconomics II

Time: 2 HOURS

Full Marks 30

Answer any three of the followings.

1. Consider a standard Ramsey model. Suppose the government taxes the wage income and subsidizes capital income. Also, assume that government runs balanced budget. Explain analytically as well as diagrammatically the impact of this kind of government intervention on steady state per capita physical capital and steady state per capita consumption? 10

2. Consider an economy with infinitely lived representative household maximizing the present discounted value of utility given by $U = \int_0^{\infty} [\ln c_t + a \ln l_t] e^{-\rho t} N(t)$
 Where $c(t)$ is the per capita consumption, l_t is the fraction of leisure time enjoyed by the representative household and $N(t)$ is the total population of the economy. Suppose the individuals are endowed with 1 unit of time, out of which individuals allocate $(1-l_t)$ for production and l_t for leisure. It is assumed that population grows at constant exogenous rate n . a is positive constant. The production function of the economy is given by $Y(t) = A K^{\beta} [(1-l)N]^{1-\beta}$ where A is the level of technological index that is assumed to be constant here. The output over aggregate consumption is accumulated as physical capital. Thus, $\dot{K} = Y(t) - N(t)c(t)$. Suppose steady state is defined as a situation when per capita consumption grows at constant rate and l_t is constant.
 (a) Find out steady state growth rate of aggregate output, physical capital and per capita consumption.
 (b) Are these growth rates exogenous or endogenous? Explain your answer.
 (c) Also find out the fraction of leisure time enjoyed by the representative individual at steady state. 3+3+4

3. a) What is the difference between funded and unfunded social security system?
 b) Can the economy with any social security system Pareto dominate the competitive equilibrium without social security? Justify your answer using an overlapping generations model.

3+7

[Turn over

4. Consider a basic Real Business Cycle model. The production function of the economy is given by

$$Y_t = K_t^\alpha (A_t L_t)^{1-\alpha}, 0 < \alpha < 1$$

Output is divided between consumption and investment.

Assuming full depreciation, the capital stock in period $t + 1$ is given by

$$K_{t+1} = Y_t - C_t$$

Technology A_t is subject to random disturbances.

$$\ln A_t = \bar{A} + gt + \widetilde{A}_t$$

Where \widetilde{A}_t is the random component of $\ln A_t$.

The representative household maximizes the expected value of the present discounted value of utility given by $U = \sum_{t=0}^{\infty} e^{-\rho t} (\ln c_t + b \ln(1 - l_t)) \frac{N_t}{H}$

where $b > 0$ and N_t is the population and H is the number of households. Population grows exogenously at rate n . In this model, if the random component of log technology follows first order autoregressive process, show that the departure of log output from its normal path follows a second order autoregressive process. 10