Tentin päivämäärä / Date of exam:6.6.2016	Tentin kesto tunteina / Exam in hours:4
Tiedekunta / Faculty: OBS	
Opintojakson koodi, nimi ja tentin numero / The code and the name of the course and number of the exam: 721310S Economic Theory II. Kesätentti.	
Tentaattori(t) / Examiner(s): Prof. Mikko Puhakka	Sisäinen postios. / Internal address : Taloustiede/OBS
Sallitut apuvälineet / The devices allowed in the exam: ☒ Nelilaskin / Standard calculator; x Funktiolaskin / Scientific calculator; ☐ Ohjelmoitava laskin / Programmable calculator; ☐ Muu materiaali, tarkennettu alla / Other material, specified below:	
Tenttiin vastaaminen / Please answer the questions: ☒ Suomeksi / in Finnish; ☒ Englanniksi / in English	
Kysymyspaperi on palautettava / Paper with exam questions must be returned: ☒ Kyllä / Yes; ☐ Ei / No	

University of Oulu
Economics
Fall 2015
Professor Mikko Puhakka
Econ Theory II, Exam Summer 2016, June 6, 2016.

Answer all the questions. You can answer in Finnish. The weight of each question is the same.

1. (6p) Build up a formal ISLM model with the appropriate assumptions so that fiscal policy is ineffective.

2. (6p) Let the two period lived consumer's lifetime utility function be: $v(c_1,c_2)=c_1+\beta\ln c_2$, where $1>\beta>0$. The lifetime budget constraint is: $c_1+\frac{c_2}{R}\leq y_1-T_1+\frac{y_2-T_2}{R}$. y_1 (y_2) are positive endowments (or incomes) and R is the interest factor. T_1 (T_2) are the lump-sum taxes in the respective periods. How does a permanent increase in taxes by the amount Δ in both periods affect the first period's consumption?

3. (6p) Let the storage technology in the two-period model be $f(k)=Ak^{\alpha}$, where $A>0$ and $1>\alpha>0$ The lifetime utility function is $v(c_1,c_2)=c_1+\beta c_2$, where $1>\beta>0$. What is the interest factor in a competitive equilibrium? Proof and a short discussion suffices (riittää)!

4. (6p) Let the aggregate production function be Cobb-Douglas: $Y = AK^{\alpha}L^{1-\alpha}, 0 < \alpha < 1$, and with $A > 0$. Denote the positive marginal propensity to save by s and the growth rate of population (the number of employed people) by n. There is no depreciation and no technical progress. Describe the evolution of this economy over time.

5. (6p) Consider the following problem: maximize $\sum_{t=0}^{\infty} \beta^t \ln c_t$ subject to $c_t + k_{t+1} = Ak_t^{\alpha}$. $0 < \beta < 1$, $0 < \alpha < 1$ and $A > 0$. Solve the problem with dynamic programming as far as you can. In particular, answer the following questions:
   (i) Write down the Bellman equation.
   (ii) Characterize the steady state.
   (iii) Sketch the dynamics as far as you can.
   (Hint: there is the Euler condition somewhere!!!)

6. (6p) Explain the contents of the Phelps-Koopmans inefficiency theorem.

7. (6p) Let the objective function (to be maximized) for the policy authority to be $M(y,\pi) = -\frac{1}{2}\left[(y - k\bar{y})^2 + a\pi^2\right]$ ja $k > 1$.
   a is the weight given to inflation in the objective function. y ($\bar{y}$) is the aggregate output (potential output) and π the rate of inflation. The private sector's behavior is described by the following Phillips curve: $y = \bar{y} + \gamma(\pi - \pi^e), \gamma > 0$. π^e is the expected inflation. Why do we need the assumption $k > 1$. Solve the time consistent equilibrium. Pay attention to the concepts, you use.

8. (6p) The public debt as a fraction of GDP (b_t) evolves over time in the following manner: $b_{t+1} = d + \frac{1+r}{1+g} b_t$. d is the primary deficit as a fraction of the GDP, r the real rate of interest and g the growth rate of the real GDP. You can assume: $r > 0$ and $g > 0$. If $d > 0$, is it possible that the debt in a stationary state is always positive? If your answer is yes, do you need some assumptions for that result?

Return the question sheet!!!