LuTK, OyKKK, KaTK, TTK, TST ja BMTK (Linnanmaan tentit)
SCI, OBS, OMS, TECH, ITEE and BMM (Linnanmaa campus)

UNIVERSITY OF OULU

YLIOPISTOTENTTI - UNIVERSITY EXAM

Opiskelijan nimi / Student name:	**Opiskelijanumero / Student number:**

Opettaja täyttää / Lecturer fills in:

Opintojakson koodi and nimi / The code and the name of the course:	
Koodi / Code: 721 310S **Tentin nimi / Exam name:** **Economic Theory II**	
Tiedekunta / Faculty: Oulu Business School	
Tentin pvm / Date of exam: March 15, 2017	**Tentin kesto tunteina / Exam in hours:** 3
Tentin nro / No. of the exam: Exam 3.	**Opintopistemäärä / Credit units:** 6
Tentaattori(t) / Examiner(s): Prof. Mikko Puhakka	**Sisäinen postios. / Internal address:**

Sallitut apuvälineet / The devices allowed in the exam:

☐ Nelilaskin / Standard calculator ☐ 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

Suomenkielisessä tutkinto-ohjelmassa olevalla opiskelijalla on oikeus käyttää arvioitavassa opintosuorituksessa suomen kieltä, vaikka opintojakson opetuskieli olisi englanti. Tämä ei koske vieraan kielen opintoja. (Kts. Koulutuksen johtosääntö 18 §)

In a Finnish degree programme a student has a right to use Finnish language for their study attainment, even though the language of instruction is English, (excluding language studies) even when the language of instruction is other than Finnish. (See the Education Regulations 18 §)

Kysymyspaperi on palautettava / Paper with exam questions must be returned:

☒ Kyllä / Yes ☐ Ei / No

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

1. (6p) Build up a *formal* ISLM model, which implies: There is a positive effect on output from an expansionary fiscal policy, but no effect on the rate of interest.

2. (6p) Let the two period lived consumer's lifetime utility function be: $v(c_1,c_2)=\frac{c_1^{1-\sigma}}{1-\sigma}+\beta\frac{c_2^{1-\sigma}}{1-\sigma}$, where $1>\beta>0$ and $\sigma>0$ and $\sigma\neq 1$. The storage technology in the two-period model is $f(k)=Ak$, where $A>0$. Solve the planner's problem, i.e. c_1, c_2 and k. Is the solution always unique? Argue briefly that your solution is also a competitive equilibrium.

3. (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!!!).

4. (6p) Consider the following macro model, where the variables are in logarithms:
   (1) $m=p+y$
   (2) $p=p^e+a(y-y^*),\ a>0$
   (3) $m=\overline{m}+\omega$.
   Equation (1) is the demand function for money, (2) is the Phillips curve and (3) the monetary policy rule. y^* is the potential output. ω is a shock to monetary policy. Its mean is zero and the variance is finite. p^e is the expected price level. Solve the rational expectations equilibrium of the model, i.e. solve the level of aggregate output (y) and price level (p) in that equilibrium. What is p^e, when the economic agents (taloudenpitäjät) have rational expectations?

5. (6p) Build up a formal neoclassical (Solow, Swan) growth model, and characterize the golden rule allocation.

6. (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? Under what conditions does the debt (per GDP) explode?

Return the question sheet!!!