



## YLIOPISTOTENTTI - UNIVERSITY EXAM

<b>Opiskelijan nimi / Student name:</b>	<b>Opiskelijanumero / Student number:</b>
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Opettaja täyttää / Lecturer fills in:

<b>Opintojakson koodi and nimi / The code and the name of the course:</b> <b>721346S</b> <b>Intermediate Macroeconomics</b>	
<b>Tiedekunta / Faculty:</b> Oulu Business School	
<b>Tentin pvm / Date of exam:</b> 23.2.2016	<b>Tentin kesto tunteina / Exam in hours:</b> 4
<b>Tentin nro / No. of the exam:</b> 2. retake	<b>Opintopistemäärä / Credit units:</b> 6
<b>Tentaattori(t) / Examiner(s):</b> Matti Koivuranta	<b>Sisäinen postios. / Internal address:</b> Oulu Business School, Department of Economics
<b>Sallitut apuvälineet / The devices allowed in the exam:</b> <input type="checkbox"/> Nelilaskin / Standard calculator <input type="checkbox"/> Funktiolaskin / Scientific calculator <input type="checkbox"/> Ohjelmoitava laskin / Programmable calculator <input type="checkbox"/> Muu materiaali, tarkennettu alla / Other material, specified below:	
<b>Tenttiin vastaaminen / Please answer the questions:</b> <input checked="" type="checkbox"/> Suomeksi / in Finnish <input checked="" type="checkbox"/> Englanniksi / in English	
<b>Kysymyspaperi on palautettava / Paper with exam questions must be returned:</b> <input type="checkbox"/> Kyllä / Yes <input checked="" type="checkbox"/> Ei / No	

**All five questions should be answered!**

## INTERMEDIATE MACROECONOMICS

3. Exam 23.2.2016

Matti Koivuranta

*All five questions should be answered!*

1. Determine whether following statements are true or false. Right answer is worth 0.5 points and wrong answer costs 0.5 points. The total points cannot be negative however. There is a single right answer to each item.
  1. A good is an inferior good if the substitution effect dominates the income effect.
  2. In general equilibrium macro models fiscal policy has no effect on the economy.
  3. Unemployment rate means the ratio of unemployed people to working age population.
  4. Production function  $F(K, N) = K^{0.3}N^{0.7}$  has constant returns to scale.
  5. The government purchases of national income accounts include e.g. defense costs, costs of public education and unemployment benefits.
  6. Current account is by definition equal to net exports.
  7. According to Fisher equation there is an approximate relation  $r = R - i$  between nominal interest rate  $R$ , real interest rate  $r$  and inflation rate  $i$ .
  8. Gross domestic product is a flow variable.
  9. There is no significant correlation between investments and gross domestic product at business cycle frequencies.
  10. First fundamental welfare theorem states that general equilibrium allocation is Pareto efficient under certain conditions.
  11. Central banks typically use changes of reserve requirements in their day-to-day control of the money supply.
  12. Gross national product of Finland includes profits from a plant which is located in China but owned by a Finnish firm.

2. Assume the following Solow growth model. Savings rate is  $s$  from which it follows that investments  $I$  and consumption  $C$  are

$$\begin{aligned} I &= sY \\ C &= (1 - s)Y, \end{aligned}$$

where  $Y$  is production. Production function is of Cobb-Douglas form:

$$Y = K^\theta N^{1-\theta}.$$

In above equation  $K$  is capital stock which has law of motion

$$K' = (1 - d)K + I,$$

where  $d$  is the depreciation rate. Second argument of production function is labor force  $N$ . Labor force grows with rate  $n$ :

$$N' = (1 + n)N.$$

Parameters have following restrictions:

$$0 < s < 1$$

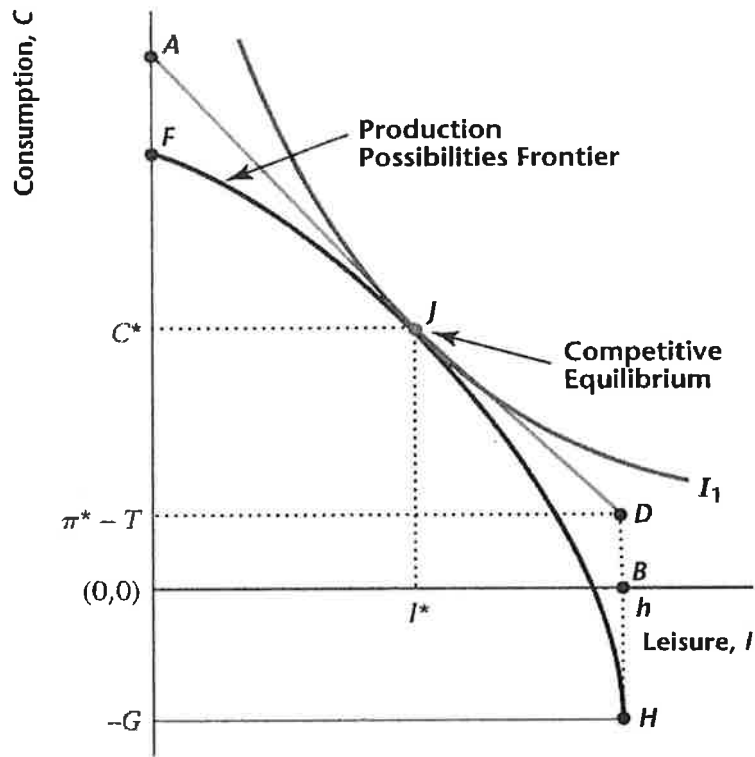
$$0 < \theta < 1$$

$$0 < d < 1$$

$$n \geq 0.$$

- Derive the law of motion for capital per capita ( $K/N$ ).
- Show that capital per capita ( $K/N$ ) has a strictly positive steady state which is stable.
- What does golden rule mean within the Solow model?

3. a) What does Ricardian equivalence mean?  
b) What does a lump-sum tax mean?
4. Following figure depicts the equilibrium of the closed economy one period model. Analyze graphically the effects of an increase in government spending  $G$ . In particular, find out what happens to employment, output, consumption and real wage.



5. Compare general equilibrium macro models that are based on classical principles to Keynesian macro models. In particular tell what are the important differences in basic assumptions and how the effects of monetary and fiscal policy differ across the models.