UNIVERSITY OF OSLO
DEPARTMENT OF ECONOMICS

Exam: **ECON4620 – Public Economics I**

Date of exam: Tuesday, May 16, 2017   **Grades are given:** June 7, 2017

Time for exam: 2.30 p.m. – 5.30 p.m.

The problem set covers 2 pages

Resources allowed:
- No written or printed resources – or calculator - is allowed (except if you have been granted use of a dictionary from the Faculty of Social Sciences)

The grades given: A-F, with A as the best and E as the weakest passing grade. F is fail.

Problem 1 (20%)
   a) What is meant by a distortionary tax? Give an example of a distortionary tax and briefly explain why the tax is distortionary.

   b) Why can it be necessary to use a distortionary tax?

Problem 2 (20%)
The government considers increasing the marginal tax rate for top incomes, i.e., for incomes above $\bar{y}$.

   a) What kind of effects should the government expect? Briefly explain the different effects.

   b) Brewer et al. (2010) derive the optimal marginal tax rate on top incomes (τ) as

$$\tau = \frac{1 - g}{1 - g + a \cdot \varepsilon}$$

with $a = \frac{y}{y - \bar{y}}$ where y is the average income of tax payers in the top income bracket, g denotes the average welfare weight of top earners' consumption, and ε is the taxable income elasticity.

Interpret this result.

Problem 3 (30%)

Suppose an investor decides how much to invest in a corporation and in a financial asset. In the absence of taxes, the return to capital K invested in the corporation is $f(K)$. The rate of return to the financial asset is i. Net corporate income is paid out as dividends.

a) What is the investor's objective and the first-best solution, respectively? Briefly explain your results.

b) Assume there is a corporate tax rate t_c and a tax rate t_p that applies to any kind of personal income. There is no allowance for corporate equity (ACE).

   Characterize the optimal investment of the investor and explain your result briefly.

c) Assume the tax system is as in part b) and the government considers introducing an ACE. Discuss advantages and disadvantages of the reform.

Problem 4 (30%)

Suppose the n agents in a population have a utility function given by $u(x_i, g)$ where x_i is the private consumption of agent i and g is the amount of a public good.

a) Give an interpretation of $\frac{\partial u/\partial g}{\partial u/\partial x_i}$.

Suppose the cost of producing a unit of g is equal to c.

b) Give an economic interpretation of the Samuelson rule:

$$\sum_{i=1}^{n} \frac{\partial u(x_i, g)/\partial g}{\partial u(x_i, g)/\partial x_i} = c$$

Suppose g is financed by distortionary taxes, and assume that the government is concerned with social efficiency and possibly social welfare.

c) Discuss if there are circumstances in which the Samuelson rule will be valid or not valid in this case. It is sufficient to consider *a few* circumstances. State precisely which assumptions you base your discussion on.