

AUSTRALIAN NATIONAL UNIVERSITY

First Semester Examination 2008

PUBLIC ECONOMICS – THEORY (P)

(ECON2131)

Writing period: 3 Hours duration

Study period: 30 Minutes duration

Permitted materials: Non-programmable Calculators

You must attempt to answer all questions.

All questions to be completed in the script book provided.

QUESTION 1

- (a) State the conditions for exchange, production and product-mix efficiency. Provide an intuitive explanation and a graphical representation for each of them. (6 points)
- (b) The First Welfare Theorem claims that competitive markets result in a Pareto efficient outcome. Explain in detail why this is so. (2 points)
- (c) State the Second Welfare Theorem. What are the implications for the issues of efficiency and distribution? (2 points)

QUESTION 2

The meaning of inequality comparisons depends critically upon the axiomatic basis that is specified for the inequality rule.

- (a) Provide the intuition for the transfer principle, the population principle and decomposability. (3 points)
- (b) Provide also the intuition for translation independence and scale independence, and show graphically that, for meaningful inequality comparisons, they cannot both be true at the same time. (3 points)
- (c) Explain the Lorenz curve approach to measure inequality. Which of the above principles lie behind this measure and why? (4 points)

QUESTION 3

- (a) What characterizes a pure public good? Explain in detail the implications of each characteristic and support your explanation with examples. (5 points)
- (b) Which is the efficiency condition for public goods? Explain the intuition behind and show how economists construct the *collective* demand curve for public goods. Provide a graphical representation. (5 points)

QUESTION 4

Suppose that two firms emit a certain pollutant. The marginal cost of reducing pollution for each firm is as follows: $MC_1 = 300e_1$ and $MC_2 = 100e_2$, where e_1 and e_2 are the amounts (in tons) of emissions reduced by the first and second firms, respectively. Assume that in the absence of government intervention, firm 1 generates 100 units of emissions and firm 2 generates 80 units of emissions.

- (a) Suppose regulators decide to reduce total pollution by 40 units. In order to be cost effective, how much should each firm cut its pollution? (2.5 points)
- (b) What emissions fee should be imposed to achieve the cost-effective outcome? How much would each firm pay in taxes? (2.5 points)
- (c) Suppose that instead of an emissions fee, the regulatory agency introduces a tradable permit system and issues 140 permits, each of which allows the emission of one ton of pollution. Firm 1 uses its political influence to convince the regulatory agency to issue 100 permits to itself and only 40 permits to firm 2. How many, if any, permits are traded between the firms? By how many tons does each firm end up reducing its pollution? (2.5 points)
- (d) Provide a graphical representation. (2.5 points)

QUESTION 5

Suppose that the government introduces an income maintenance program for low-income people that offers a basic grant of \$200 per month, but that for any earnings above \$0, the grant is reduced dollar-for-dollar (that is, the marginal tax rate is 100%).

- (a) Assume that an individual can earn \$10 per hour and has no other income. Sketch her budget constraint with and without the program in effect. Carefully label the axes, intercepts, and all kink points. At how many hours of work is the grant reduced to zero? (2.5 points)
- (b) According to economic theory, what would happen to the individual's hours worked and total income if the government instituted this welfare plan? (2.5 points)
- (c) Suppose the government decides to keep the monthly base grant at \$200, but to lower the implicit marginal tax rate on earnings to 66.67%. Draw the new budget constraint. (2.5 points)
- (d) Relative to the first plan, how will the introduction of the new plan affect the individual's hours of work and total income? (2.5 points)

QUESTION 6

The trade-off between efficiency and equity is always at the heart of all tax debates.

- (a) Explain this tension with reference to the differences between proportional and progressive linear income tax schedules. Support your explanation with a graph. (5 points)
- (b) Explain also how nonlinear income tax structures may be able to increase the amount of redistribution without increasing the deadweight loss associated with the tax. Support your explanation with a graph. (5 points)