

time : 50 minutes

Do all 3 questions. All count equally.

1. If person 1's demand function for a public good could be written

$$z_1 = \frac{Y_1}{3p_1}$$

and person 2's demand function for the public good could be written

$$z_2 = \frac{2Y_2}{3p_2}$$

where  $z_i$  is the quantity demanded of the public good by person  $i$ , as a function of her income  $Y_i$  and of the personalized ("Lindahl") price  $p_i$  she has to pay for the public good, then what is the quantity which should be provided of the public good — as a function of the people's incomes — when Lindahl ("benefit") taxation is used to finance the public good, if the cost of 1 unit of the public good is \$1?

2. Briefly describe a mechanism which will induce people to reveal truthfully their inverse demand curves  $p_i(Z)$  for a public good (where  $p_i(Z)$  denotes person  $i$ 's marginal willingness to pay for a little more of the public good, as a function of the quantity  $Z$  provided of the public good).

3. Suppose there is some input  $Z$  with the following properties : increases in firm 1's purchases  $Z_1$  of the input lead to increased profits for firm 2, and increases in firm 2's purchases  $Z_2$  of the input lead to increased profits for firm 1.

Is the equilibrium allocation efficient, when each firm chooses its own input quantities so as to maximize its own profit?

Explain briefly.