Ex/UG/ECO/51/34/2018

BACHELOR OF ARTS EXAMINATION, 2018

(3rd Year, 5th Semester)

ECONOMICS (HONOURS)

PUBLIC ECONOMICS

Time : Two hours | Full Marks : 30

Answer ***any four*** questions.

1. i.a. Explain why externalities are a potential cause of "market failure". Will they inevitably require state intervention to ensure efficient outcomes? [1.5+2]

   ii. A competitive refining industry releases one unit of waste into the atmosphere for each unit of refined product. The inverse demand function for the refined product is $p^d = 20 - q$, which represents th marginal benefit curve where q is the quantity consumed when consumers pay price p^d. The inverse supply curve of refining is MPC=2+q, which represents the MPC curve when industry produces q units. The marginal external cost curve MEC=0.5q, where MEC is the marginal external cost when industry releases the q units of waste. Marginal social cost is given by MSC=MPC+MEC

   b. What are the equilibrium price and quantity for the refined product where there is no correction for externality? [2]

   c. Suppose that the government imposes emission fee of T per unit of emissions. How large must the emission fee be if the market is to produce the socially efficient amount of the refined product? [2]

2. i. Assume there are two consumers with preferences described by U=log (x) + log (G). Both consumers have income M. Government asks each consumer to announce their demand for the public good as a function of the share of cost they pay. The cost shares are chosen so that both consumers demand the quantity of public good in equilibrium. Consumer 1 pays share τ_1 and consumer 2 pays share τ_2, with $\tau_1+\tau_2 = 1$. The government insists that the demand function is linear, and consumers announce the intercept they think is best. Hence consumer I announces the value a_i in the demand function $G=a_i - b\tau_i$.

   a. Determine the level of public good provision. [3]

   b. Explain the above problem graphically. [2]

   c. What would be the equilibrium outcome if both consumers tried to manipulate the equilibrium? [2.5]

3. a. What will be the efficient membership level of a club if there is no congestion? Is it still appropriate to call it club good if there is no congestion? [1+1]

b. Theme parks do not use two part tariffs. What is the consequence? (Explain with a suitable model). Why do they choose not to use two part tariffs? [4+1.5]

4. Let the consumer have the utility function $u = x_1^{\rho_1} + x_2^{\rho_2} - l$, where l is the labour hours and the budget constraint is $wl = q_1x_1 + q_2x_2$ where $q_1 = 1+t_1$, $q_2 = 1+t_2$

a. letting $p_1=p_2=1$, use the inverse elasticity rule to show that the optimal tax rates are related by $\frac{1}{t_2} = \left[\frac{\rho_2 - \rho_1}{1-\rho_2}\right] + \left[\frac{1-\rho_1}{1-\rho_2}\right]\frac{1}{t_1}$. [3]

b. Setting w=100, ρ_1=0.75, and ρ_2=0.5, find the tax rates required to achieve revenue of R=300 and R=10. [2]

c. Calculate the proportional reduction in demand for two goods comparing the no tax position after introduction of the optimal taxes for both revenue levels. Comment on the results. [2.5]

5. i. An individual has to choose her division of time, L, between labour , l, and leisure, L-l.her hourly wage is w.

   a. Use a diagram to show optimal choice without taxation. [1]

   b. Show how choice changes when income tax at rate t is introduced. Identify the income and substitution effects caused by income tax. What is total effect on labour supply? [1.5]

   c. Express the revenue raised by the income tax in terms of units of consumption. [1.5]

   ii) Assume utility is $u = x - l^2$ where l is the labour hours and the income constraint is $M = b+(1 - t)\, wl$. How is the choice of l affected by increase in b and t? Explain these effects. [3]

6. i. A consumer has preferences described by $U = \log(x_1) + \delta\log(x_2)$, x_t denotes consumption in period t and $0 < \delta < 1$. Assume that the price of consumption is 1 in both periods and that the interest rate is r. If the consumer has income M>0 in period 1 and no income in period 2,

   a. find their optimal levels of saving and consumption plan. [3]

   b. Find out the elasticity of savings with respect to interest rate. [1.5]

   c. How is saving affected by changes in interest rate and discount factor δ? Explain your results. [3]