

**MASTER OF ARTS EXAMINATION, 2019**

( 1st Year, 2nd Semester )

**ECONOMICS****GENERAL EQUILIBRIUM AND WELFARE**

Time : Two hours

Full Marks : 30

Answer **any two** questions :

1. a) Prove for  $n$  agents that if each consumers utility function is strictly increasing and strictly quasi concave and if aggregate endowment is strictly positive, then there exists at least one price vector  $p^* \gg 0$  such that the vector of excess demand  $z(p^*)=0$ . 10

b) In a two commodity exchange economy let ' $\rho$ ' be the price of commodity 1 in terms of commodity 2. Suppose the excess demand function for commodity 1 is given by

$$1 - 4\rho + 5\rho^2 - 2\rho^3$$

How many equilibria are there? Are they stable or unstable? How might your answer be affected if there were an increase in the stock of commodity 1 in the economy ? 5

2. a) In a  $r$  fold replica economy show that there will be equal treatment at the core.

b) Also show that the core of the economy shrinks as the economy is replicated.

c) There are  $r$  girls and  $r$  boys, where  $r$  is a positive integer. The only two goods are bread and honey, quantities of which will be denoted by  $x$  and  $y$ :  $x$  denotes loaves of bread and  $y$  denotes pints of honey. Neither the girls nor the boys are well endowed: each girl has 8 pints of honey but no bread, and each boy has 8 loaves of bread but no honey. Each girl's preference is described by the utility function  $u_g(x,y) = \min(ax,y)$  and each boy's by the utility function  $u_b(x,y) = x + y$ .

Determine the Walrasian excess demand function for honey and the Walrasian equilibrium prices and allocations. 5+5+5

3. a) Show that If consumers have a well-defined utility function,  $u^i$  that is strictly monotonic, then every Walrasian allocation is in the core. 5

b) We have two agents with indirect utility functions:

$$v^1 = \ln m_1 - \alpha \ln p_x - (1-\alpha) \ln p_y$$

And

$$v^2 = \ln m_2 - \beta \ln p_x - (1-\beta) \ln p_y$$

where  $m_i$  is the income of the  $i$ th person, while  $p_x$  and  $p_y$  are the prices of goods  $x$  and  $y$ , respectively. The initial endowments for person 1 and person 2 are  $\omega_1 = (x = 1, y = 1)$  and  $\omega_2 = (x = 1, y = 1)$ , respectively. Calculate the market clearing prices.

5.

c) Prove the existence of second welfare theorem in a production economy. 5

4.a) Using suitable axioms graphically show the existence of Rawlsian social welfare function. 8

b) In a two-producer, two consumer economy, two goods (goods  $x$  and  $y$ ) are produced with labour ( $z$ ) only according to

$$x = z_x$$

$$y = \sqrt{z_y}$$

The consumers have preferences over both goods. Person  $i$ 's preferences can (for  $f = 1, 2$ ) be represented by the utility function

$$u^1 = x_1^{1/6} y_1^{5/6}$$

$$u^2 = x_2^{2/3} y_2^{1/3}$$

Both people are endowed with one unit of time. Suppose consumer 1 receives all profits from production in both sectors. Set the wage rate  $w = 1$ . Find the Walrasian equilibrium prices  $p_x$  and  $p_y$ , the equilibrium allocation of time in both sectors, and the equilibrium allocation of consumption goods in this economy. 7