Uva Wellassa University
BSc in Export Agriculture

End Semester Examination August/September 2011
Year III Semester II

Uva Wellassa University

Theories of Agricultural Resource Management EAG 323-3

Instructions

Answer **all** questions. Each question bears equal marks.
No. of questions : Five (05)
No. of pages : Three (03)
Total marks allocated : 40%
Time : Three Hours (03 hrs)

1.

a. What is meant by 'Coase Theorem'?

b. Give conditions required for efficient working of the Coase Theorem.

c. Illegal cultivation of cinnamon on a hilly forest land is causing siltation problems downstream affecting paddy farming. Think of a 2, 000 ha portion of a hilly forest area which currently remains a rain forest. If this land was converted to cinnamon cultivation, the total profits of the cinnamon farmers would increase as more land area (L) is converted to cinnamon. The profits of the cinnamon farmers are given by the following equation.

Total Profits (Cinnamon) = L * (800 – 0.2L)

Cultivation of cinnamon would cause a decline in profits from paddy.

Total profits (paddy) = 1, 000, 000 – (20L + $4L^2$ / 8)

If the 2, 000 ha of forest land were owned by cinnamon farmers and they intended to convert the land to cinnamon cultivation, would the paddy farmers be willing to buy any of the 2, 000 ha from cinnamon farmers? If so, how much would they buy? And at what price? What would be the profits of cinnamon and paddy farmers after the sale of land?

2.

a. Define the following terms;
   i. Depletable resources.
   ii. Renewable resources.
   iii. Replenishable resources
   iv. Open access resources
   v. Common pool resources

b. Determine the equilibrium conditions for efficient intertemporal extraction of oil under the following conditions and two cases

- **Two periods (T_0 and T_1)**
- **Variable resource demand given by the equations**

  $D_0: P_0 = 10 - 0.20Q_0$ – Current Period

  $D_1: P_1 = 30 - 0.50Q_1$ – Future Period

Where P_0 and P_1 are the prices of oil in \$ per billion barrel (bbl) and Q_0 and Q_1 are the quantities demanded in bbl

Case One

Unrestricted supply

Zero marginal extraction cost and Positive marginal extraction cost of 5 \$

Discount rate is 8%.

Case Two

Restricted supply ($\mathbf{Q_0 + Q_1 = 80}$)

Zero marginal extraction cost

Discount rate is 8%.

i. Determine Q_0 and Q_1 (efficient extraction rates of oil in the two time periods)

ii. Determine Net Social Benefit from the optimum allocation

3. Write explanatory notes on **three** of the following.
   a. Command Control Methods in Managing Externalities
   b. Market failures
   c. Product Differentiation and Economic Progress
   d. The Concept of Sustainability

4.
   a. Discuss the requirements for achieving Pareto Efficiency in resource allocation.
   b. It is said that any point inside the production possibility frontier is technically inefficient. WHY?
   c. Prove that, for optimal resource allocation, the marginal rate of substitute between any two commodities must be the same as the marginal rate of transformation between these two commodities for any producer

5.
   a. The efficient allocation of water between two groups can be illustrated with a static model not unlike the dynamic model used for allocations between two periods. Do you agree with this statement (use suitable illustrations to explain your answer)?
   b.
      i. Discuss the following in relation to fisheries
         1. Population Growth relationship
         2. Effort Catch relationship
         3. Open access equilibrium
      ii. Distinguish between Maximum Sustainable Yield and Maximum Economic Yield of fisheries and show graphically how you find the Maximum Economic Yield.

10