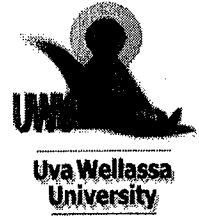


Uva Wellassa University
Faculty of Animal science & Export Agriculture
BSc in Export Agriculture



End Semester Examination September/ October 2012
Year III Semester II

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 : Four (04)

Time : Three hours (03hrs)

Total marks allocated : 40%

1.

- a. Consider the following two cases and two conditions for efficient intertemporal extraction of oil

Case 1

Two periods (T_0 and T_1)

Constant oil demand is given by the equation

$$P = 50 - 0.5Qd$$

Where P is the price of oil in \$ per barrel (bbl) and Qd is the quantity demanded in bbl

Condition 1

No supply restriction

Zero Marginal Extraction Cost $MEC = 0$

Positive Marginal Extraction Cost $MEC = 5$

Discount rate is 8%

Condition 2

Restricted oil supply ($Q_0 + Q_1 = 100$)

Q_0 = Quantity of oil extracted in time period T_0 and Q_1
= quantity of oil extracted in time period T_1

Zero Marginal Extraction Cost $MEC = 0$

Positive Marginal Extraction Cost $MEC = 5$

Discount rate is 8%

Case 2

Two periods (T_0 and T_1)

Variable resource demand given by the equations

$$D_0: P_0 = 150 - 20Q_0 - \text{Current Period}$$

$$D_1: P_1 = 450 - Q_1 - \text{Future Period}$$

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

Condition 1

Unrestricted supply

Zero marginal extraction cost and Positive marginal extraction cost of 50 \$

Discount rate is 10%.

Condition 2

Restricted supply ($Q_0 + Q_1 = 300$)

$Q_0 = \text{Quantity of oil extracted in time period } T_0 \text{ and } Q_1$
 $= \text{quantity of oil extracted in time period } T_1$

Zero marginal extraction cost

Discount rate is 10%.

- i. Determine Q_0 and Q_1 in each case (efficient extraction rates of oil in the two time periods)
- ii. Determine Net Social Benefit from the optimum allocation in each case

2.

- a. Briefly explain Normative Criteria for decision making.
- b. Discuss market based solution towards externalities.

- c. "Some command and control decisions may violate the cost effectiveness criterion". Discuss this.
- d. "A pollution permit trading system gives right to a market for pollution rights". Comment on this using an example

3.

- a. Define the term "Fishery"
- b. Briefly explain the variables in fishery.
- c. "Increase in fishing effort always increases the profit in fishery".

Comment on this

- d. The effort catch relationship (production function) of a fishery is given by,
 $Y = 1200E - 2E^2$

Where Y is the sustainable yield measured in kilograms of fish and E is fishing effort measured in number of fishing trips. Each fishing trip costs Rs.900.00. Fish sell at Rs.40.00 per kilogram.

Derive the following

- i. Maximum effort which yields no yield
- ii. Maximum Sustainable Yield, corresponding level of fishing effort and private profit
- iii. Maximum Economic Yield, corresponding level of fishing effort
- iv. Find the open access equilibrium level of effort

4.

- a. Briefly explain how to determine the optimum water and yield for maximum income from irrigated crops. Use functions and graphs where necessary



- b. Given below is a cost table of water supply agency. However, a few figures have been recorded.

Output	FC	VC	AVC	AFC	ATC	MC
0			XX	XX	XX	
1						320
2						260
3						240
4	100					220
5						200
6						200
7						220
8						260
9						340
10						480

- i. Complete the table
 - ii. Calculate and indicate the optimum water supply level
- 5.
- a. Define the followings;
 - i. Marginal Revenue Product (MRP) of labor
 - ii. Marginal Factor Cost (MFC) of labor
 - b. Briefly explain what firms do when;
 - i. $MRP > MFC$
 - ii. $MRP < MFC$
 - c. Derive the equation for MRP curve and briefly explain it using sketches
 - d.
 - i. Define the term "Monopsony"
 - ii. "A monopsony firm faces the entire market labor supply curve".
Comment on this using an illustration
 - iii. Discuss "Wage and employment determination under a monopsony labor market"