

BSc in Export Agriculture
Third Year Second Semester Examination – December/January 2017/2018
Theories of Agricultural Resource Management (EAG 323-3)

Essay Questions

Instructions:

Answer **all** questions in the given booklet.

No. of questions : Five (05)

No. of pages : Three (03)

Time : Three (03) hours

Total marks allocated : 100%

01. Write explanatory notes on the followings;

- (I) Management of Surface Water Resources (50 marks)
- (II) Allocation of Public Goods (50 marks)

02.

- (I) Define;
- a) Exhaustible Resources (10 marks)
- b) Renewable Resources (10 marks)
- c) Open Access Resources (10 marks)
- (II) “Efficient extraction of an exhaustible resource must account for market dynamic”. Do you agree with this statement? Justify your answer (20 marks)
- (III) Determine the equilibrium conditions for efficient intertemporal extraction of oil under the following conditions for the two cases provided. (50 marks)

Hint;

You need to determine Q_0 and Q_1 under each case (efficient extraction rates of oil in the two time periods) and Net Social Benefit from the optimum allocation

Conditions

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

$$D_0: P_0 = 50 - 0.20Q_0 - \text{Current Period}$$

$$D_1: P_1 = 30 - 0.50Q_1 - \text{Future Period}$$

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

Case One

Unrestricted supply

Zero marginal extraction cost and Positive marginal extraction cost of 25 \$

Discount rate is 8%.

Case Two

Restricted supply ($Q_0 + Q_1 = 200$)

Zero marginal extraction cost

Discount rate is 10%.

03.

(I) With the use of suitable illustrations describe the following in relation to fishery:

- a) Sustainable Yield (20 marks)
- b) Maximum Sustainable Yield (20 marks)
- c) Maximum Economic Yield (20 marks)
- d) Open Access Equilibrium (20 marks)

(II) The effort catch relationship (production function) of a fishery is given by,

$$Y = 90E - 2E^2$$

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.

Determine the following

- a) Maximum Sustainable Yield, corresponding level of fishing effort and private profit (09 marks)
- b) Maximum Economic Yield, corresponding level of fishing effort (06 marks)
- c) Find the open access equilibrium level of effort (05 marks)

04.

(I) Define the term “Elasticity of Production”. (10 marks)

(II) What can be said about the elasticity of production, assuming the classical production function, at the output when;

- a) MPP is at maximum? (10 marks)
- b) APP is at maximum? (10 marks)
- c) MPP is zero? (10 marks)
- d) $MPP = APP$? (10 marks)
- e) MPP is negative? (10 marks)
- f) MPP is less than APP? (10 marks)

(III) Consider the production function $Y = 70 + 3X^2 - 0.02X^3$

Find;

- a) MPP and APP functions (10 marks)
- b) The level of X at which Y is maximum (10 marks)
- c) the level of X at which MPP is maximum (10 marks)

05.

(I) Environmental Problems occur due to two major problems. Name and explain them. (40 marks)

(II) What is meant by Coase Theorem? (20 marks)

(III) Explain the application of Coase Theorem in dealing with one of the problems mentioned in part (I) (40 marks)