MASTER OF ARTS EXAMINATION, 2023

(2nd Year, 1st Semester)

ECONOMICS

[ENVIRONMENTAL AND RESOURCE ECONOMICS I]

Time : Two Hours Full Marks : 30

SECTION - A

1. **Answer any *one* question a or b.** 10x1=10

(a) Consider optimal growth in an economy in which

$$\text{Max}\int_0^{\infty} U(C)e^{-\rho t}dt$$

Subject $\dot{K} = F(K,L,X)–C$ and $\dot{X} = – bx + \gamma F(K,L,X)$

Where, C=Aggregate consumption, U(.)=Aggregate utility function, =Social discount rate, K=Stock of produced capital, L=Current labor force, =Net pollution increments, b=Rate of pollution evaporation rate by natural environmental stock regeneration, =Parameter linking produced output to increments in pollution.

(i) Find the economic depreciation of environmental capital on the basis of Hartwick Approach.

(ii) Derive 'Environmentally adjusted measure of Net National Product' (ENP) after introducing abatement costs as a debit from the produced composite output. 5+5

OR

(b) (i) Derive Samuleson Rule for optimal allocation of a public good.

(ii) Explain the reason behind 'triparite' (triangular) bargaining in the Coase theorem under imperfect competition. 5+5

2. Answer any *one* question (a) or (b) 5x1=5

(a) Distinguish between weak and strong sustainability. How do Pearce and Atkinson define 'weak sustainability'? 2+3

OR

(b) What are Daly's operational principles for sustainable development? 5

SECTION - B

1. Answer any ***one*** question (a) or (b) 5x1=5

(a) "A system of transferable emission permits leads to a cost efficient achievement of a pollution target". Is this statement true or false? Give reasons. 1+4=5

OR

(b) Consider a case where the concentration of pollution at a receptor is affected by emission from two sources, the first one more distant from the receptor than the second one and therefore having a lesser impact on the mentioned concentration. Show that cost efficient achievement of a given reduction in concentration of pollution involves levying a lower emission charge on the more distant receptor. 5

2. Answer any ***one*** question (a) or (b) 10x1=10

(a) An owner of a fish pond is trying to maximize the value of fish harvest over a time horizon. Assuming F(x) to be the natural growth of fish stock, where x is the fish stock, work out the optimal trajectory of harvest, H(t), over time. Make suitable assumptions including one which says that h(t) has an upper limit. 10

OR

(b) Consider the case of a non-renewable resource where the market is characterized by competition. Given that R is the volume of initial reserves determine the relationship between R and T, the time taken for the entire reserves to get depleted. Make suitable assumptions. 10