RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

B.A./B.Sc. SIXTH SEMESTER EXAMINATION, MAY 2024

THIRD YEAR [BATCH 2021-24]

Date : 10/05/2024 **ECONOMICS [Honours]**

Time : 11 am – 1 pm **Paper : CC13** Full Marks : 50

Group :A

Answer **any two** questions: [2×15]

1. a) "We cannot give anyone the option of polluting for a fee." This comment by former US Senator Edmund Muskie reflects the view of some environmentalists. Clean air and clean water, they argue, are fundamental human rights that should not be debased by considering them in economic terms. How can you put a price on clean air and clean water? The environment is so important, they claim, that we should protect it as much as possible, regardless of the cost." Evaluate this statement from the standpoint of an economist.

   b) Why don't the high-at-risk countries jointly solve the problem of missing environmental markets?

   c) There are two firms in a polluting industry. Their profit functions are:

$$u_1=5 + E_1 - E_1^2/2$$

$$u_2=10 + E_2 - E_2^2$$

   Pollution has local damages; the marginal damage functions for emissions from each firm are:

$$MD_1=E_1$$

$$MD_2=E_2$$

   i) Let's say that the regulator has all of this information and can use command and control regulation to mandate the socially−optimal level of emissions *from each plant.* What levels of emissions does the regulator mandate from each plant?

   Instead of command and control, the regulator can also use a cap−and−trade program. Here, the total level of emissions by the two firms combined will equal the socially−optimal total level of emissions, but the regulator is letting the firms trade emissions allowances to achieve that abatement at minimum cost.

   ii) What are total emissions? Assuming that neither firm has market power in the allowance market, what will be the equilibrium allowance price?

   In this cap−and−trade program, the socially−optimal total level of emissions has been achieved at minimum cost to industry.

   iii) Is this the social optimum? If so, explain why. [4+3+(2+3+3)]

2. a) How do natural scientists and economists differ in their approaches to discussing the causes of Climate Change? Additionally, some argue that climate change is driven by the widespread operation of free markets. As a student of economics, do you agree with this view? Explain your position.

   b) Assume a perfectly competitive widget firm faces the market price of ₹20 per widget and the firm's marginal cost curve is given by *MC =0.4q*, where *q* is the daily widget production for the firm. However the firm is polluting the air so that the social marginal cost of widget production is *MCS=0.5q*. What should the amount of a government-imposed excise tax be in order to bring about the socially optimal level of production by this firm?

   c) Amestris, Xing, and Ishbal are three neighboring industrial nations that share a forest known as Kanama. The maintenance of Kanama necessitates an annual expenditure of $6,000. The clean air facilitated by Kanama holds an estimated benefit of $5,000 for Amestris, $2,500 for Xing, and $1,500 for Ishbal.

i) Is it efficient to maintain Kanama?

ii) Will any of the three countries maintain the forest on their own?

iii) The United Nations proposes that each of the three countries contribute one-third of the annual maintenance fee. It submits the matter to a vote among these nations, requiring a majority to approve implementation. Will the forest be sustained? [5+5+(2+1+2)]

3. a) Please articulate Weitzman's Rule and elucidate it through the aid of pertinent graphical representations.

   b) On the island of Pago-Pago, there are two lakes and 20 fishers. Each fisher gets to fish on either lake and gets to keep the average catch on that lake. On Lake *X*, the total number of fish caught is given by: $F^X = 10L_X - \frac{1}{2}L_X^2$, where L_X is the number of fishers in the lake. For Lake *Y*, the relationship is $F^Y = 5L_Y$.

   i) Under this organization of society, what will the total number of fish caught be? Explain the nature of the externality in this equilibrium.

   ii)The chief of Pago-Pago, being aware of the *"Tragedy of the Commons"* problem, believes that he can raise the total number of fish caught by restricting the number of fishers allowed on Lake *X*. Being basically opposed to coercion, the chief thus decides to require a fishing license for Lake *X*. If the licensing procedure is to bring about the optimal allocation of labor, what should the cost of a license be (in terms of fish)?

   [Hint for Part b.: What is the correct number of fishers on Lake X to allow in order to maximize the total catch of fish? What is the number of fish caught in this situation?]

   c) Shakti Corporation operates a sizable cement production facility adjacent to the Riverside Sports Complex. The operation of this facility yields Shakti Corp. daily benefits valued at ₹120,000. However, the Sports Complex incurs a daily cost of ₹50,000 due to the pollution generated by the cement production.

   i) In a scenario where Shakti Corp. possesses unrestricted autonomy, and both parties engage in negotiation without incurring costs, will Riverside succeed in operating its Complex with improved air quality? Conversely, assuming Riverside holds the right to clean air and Shakti Corp. requires Riverside's approval to operate its facility, will Riverside then achieve better air quality for its Complex?

   ii) What fundamental economic theory underlies the premise of part i. of the inquiry? Furthermore, in what contexts does this theory falter? [5+(2+3)+(3+2)]

Group :B

Answer **any two** questions: [2×10]

4. Why have transboundary environmental problems assumed more and more importance over the last few decades?

5. Do you agree with the observation that trade is a hindrance to growth mainly due to environmental problems? Discuss in detail.

6. Write short notes on the following: [5+5]

   a) Pollution haven hypothesis

   b) Race to the bottom

7. How do you measure the benefits and the cost associated with policies which seek to improve the environment?

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