

KATHMANDU UNIVERSITY
End Semester Examination
May/June, 2022

Mark Scored:

Level : B. Sc.

Year : III

Exam Roll No.:

Time: 30 min

Course : ENVS 303

Semester : II

F. M. : 20

Registration No.:

Date :

SECTION "A"
[20 Q. × 1 = 20 marks]

Encircle the most appropriate answers.

- Which of the following is an example of a positive externality?
 - Ram mows Hari's lawn and is paid \$100 for performing the service.
 - While mowing the lawn, Ram's lawnmower spews out smoke that Hari's neighbor Karma has to breathe.
 - Hari's newly cut lawn makes his neighborhood more attractive.
 - Hari's neighbors pay him if he promises to get her lawn cut on a regular basis.
- The discovery of a large, new reserve of crude oil will shift the _____ curve for petrol, leading to _____ equilibrium price.
 - supply, higher
 - supply, lower
 - demand, higher
 - demand, lower
- A life-saving medicine without any close substitutes will tend to have
 - small elasticity of demand.
 - large elasticity of demand.
 - small elasticity of supply.
 - large elasticity of supply.
- Which of the following is an example of a public good?
 - residential housing
 - national defence
 - restaurant meals
 - fish in the ocean
- Which of the following statements about corrective taxes is **NOT** true?
 - Economists tend to prefer them to command-and-control regulation.
 - They raise government revenue.
 - They cause deadweight losses.
 - They reduce the quantity sold in a market.
- Common resources are
 - efficiently provided by market forces.
 - underprovided in the absence of government intervention.
 - overused in the absence of government intervention.
 - a type of natural monopoly.
- Every year you deposit \$2,000 into an account that earns 2% interest per year. What will be the balance of your account immediately after the 30th deposit?
 - \$44,793
 - \$60,000
 - \$77,385
 - \$81,136

8. When the government levies a tax on a good equal to the external cost associated with the good's production, it _____ the price paid by consumers and makes the market outcome _____ efficient.
- a. increases, more b. increases, less c. decreases, more d. decreases, less
9. An investment project costs \$100,000. It is expected to have an annual net cash flow of \$25,000 for five years. What is the project's payback period?
- a. 2 years b. 3 years c. 4 years d. 5 years
10. You make \$500 monthly deposits into a fund that pays interest at a rate of 9% compounded monthly. What would be the balance at the end of 20 years?
- a. \$163,879 b. \$258,169 c. \$327,200 d. \$333,943
11. How much money should be deposited now in an account that pays 5% interest compounded annually in order to make ten equal annual withdrawals of \$7,000?
- a. \$54,052 b. \$55,402 c. \$58,916 d. \$60,594
12. The Condorcet paradox illustrates Arrow's impossibility theorem by showing that pairwise majority voting
- a. is inconsistent with the principle of unanimity.
b. leads to social preferences that are not transitive.
c. violates the independence of irrelevant alternatives.
d. makes one person in effect a dictator.
13. If the production of a good yields a negative externality, then the social-cost curve lies _____ the supply curve, and the socially optimal quantity is _____ than the equilibrium quantity.
- a. above, greater b. above, less c. below, greater d. below, less
14. Your opportunity cost of going to a movie is
- a. the price of the ticket.
b. the price of the ticket plus the cost of any drink and popcorn you buy at the theatre.
c. the total cash expenditure needed to go to the movie plus the value of your time.
d. zero, as long as you enjoy the movie and consider it a worthwhile use of time and money.
15. The Coase theorem does **NOT** apply if
- a. there is a significant externality between two parties.
b. the court system vigorously enforces all contracts.
c. transaction costs make negotiating difficult.
d. both parties understand the externality fully.
16. The government auctions off 500 units of pollution rights. They sell for \$50 per unit, raising total revenue of \$25 000. This policy is equivalent to a corrective tax of _____ per unit of pollution.
- a. \$10 b. \$50 c. \$450 d. \$500

17. Which categories of goods are excludable?
- a. private goods and club goods
 - b. private goods and common resources
 - c. public goods and club goods
 - d. public goods and common resources
18. According to rule of 72, how long will it take \$1 invested today at an annual fixed interest rate of 10% to grow to \$4?
- a. 7.2 years
 - b. 14.4 years
 - c. 6 years
 - d. 10 years
19. Many economists would argue that
- a. the optimal amount of pollution is greater than zero.
 - b. all pollution should be eliminated.
 - c. the market mechanism can handle pollution without any government intervention.
 - d. central planning is the most efficient way to eliminate pollution.
20. Which categories of goods are rival in consumption?
- a. private goods and club goods
 - b. private goods and common resources
 - c. public goods and club goods
 - d. public goods and common resources



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F. M. : 55

SECTION "B"

Attempt ALL questions. Missing parameters can be assumed suitably.

1.
 - a. What is meant by the tragedy of the commons? Use an example to explain your answer. [3]
 - b. Cups of coffee and cakes are complements. Both have inelastic demand. A hurricane in Columbia destroys half the coffee bean crop. Use appropriately labelled diagrams to answer the following questions. [3]
 - i. What happens to the price of coffee beans?
 - ii. What happens to the price of a cup of coffee? What happens to total expenditure on cups of coffee?
 - iii. What happens to the price of cake? What happens to total expenditure on cakes?
 - c. Solar Water Heating Systems can save up to 80% of the annual electricity bills of a certain home in the Kathmandu Valley. In this region, the yearly cost of electric water heating a house is about NPR 25000. With a Nepal Government's subsidy of 30% on the total installation of the system, how much can a homeowner afford to spend for a solar system if the interest rate is 9% per year? The expected life of the system is 15 years. [4]
2.
 - a. A friend in your environmental economics study group suggests that taxes on pollution are ineffective because they do not eliminate all pollution. Explain what is wrong with this argument. Should the goal of any policy be to eliminate all pollution? If not, what should be the goal? [3]
 - b. Explain each of the following statements using supply-and-demand diagrams. [3]
 - i. When a strong wind hits Terai region, the price of mango rises in supermarkets throughout the country.
 - ii. On Saturday, cinemas discount tickets.
 - iii. When a war breaks out in petroleum exporting countries, the price of petrol rises and the price of EVs increases.
 - c. Classify the following goods as private goods, common resources, club goods, or public goods: Government health insurance, FM radio signal, A physics video on YouTube, A mosquito control program in a city, A library's collection of e-books. [1]
 - d. Twelve payments of \$10,000 each are to be repaid monthly at the end of each month. The monthly interest rate is 2%. [3]
 - i. What is the present equivalent (i.e., P_0) of these payments?
 - ii. Repeat Part (i) when the payments are made at the beginning of the month. Note that the present equivalent will be at the same time as the first monthly payment.
 - iii. Explain why the present equivalent amounts in parts (i) and (ii) are different.

3.

- a. Five mutually exclusive alternatives are being considered for providing a sewage-treatment facility. The annual equivalent costs and estimated benefits of the alternatives are as follows:

Alternatives	Annual Equivalent (in thousands NPR)	
	Cost	Benefits
A	1050	1110
B	900	810
C	1230	1390
D	1350	1500
E	990	1140

Which plan, if any, should be adopted if the Sewage Authority wishes to invest if, and only if, the B-C ratio is at least 1.0? [5]

- b. The European Union banned certain pesticides for 2 years after studies found links between the use of these insecticides and a decline in the bee population. In particular, research has shown that the use of imidacloprid, clothianidin, and thiamethoxam on flowering crops has adversely affected the honeybee population in North America and Europe. [5]
- Consider the private market for these pesticides. Use supply and demand curves to show the equilibrium level of pesticides that will be produced and consumed.
 - How might the impact of the insecticide on honey bees be modeled as a marginal external cost? How could the government discourage the production and use of these insecticides?
 - Is the private market outcome socially efficient?

4.

- There is often litter along highways but rarely in people's yards. Provide an economic explanation for this fact. [2]
- What does it mean to say that an individual or firm has internalized an externality? [2]
- What is the Coase Theorem? Under what conditions will the Coase Theorem break down? Explain. [3]
- How does a command-and-control policy differ from a market-based policy? Explain. [3]

5.

- Suppose we have a small inhabited island with three residents and a volcano that generates air pollution. Two people live upwind of the volcano and one person lives downwind. For \$21,000 we can clean up the volcano with a patented "smoke guzzler." The two upwind people would pay \$1,000 each to get rid of the smoke whereas the downwind person would be willing to pay \$15,000. Consider two plans to finance the "smoke guzzler." Plan A calls for a tax of \$7,000 per person. Plan B calls for the affected part (the downwind person) to pay \$21,000 and everyone else nothing. Compare each plan to the status quo and indicate society's choice using [3]
 - the Pareto criterion;
 - majority rule;
 - the compensation principle.
- Evaluate and explain the following statement: "When products pollute, government solutions are more efficient than market solutions." [3]

- c. A piece of new equipment has been proposed by engineers to reduce pollution and hence a pollution tax of a certain manufacturing company. The investment cost is \$25,000, and the equipment will have a market value of \$5,000 at the end of a study period of five years. Decreased pollution saves \$8,000 of tax per year. Draw a cash-flow diagram for this investment opportunity. If the firm's MARR is 20% per year, is this proposal a sound one? [4]

6. Write short notes (*ANY TWO*) [5]

- a. Emission Trading
- b. Free rider Problem
- c. Benefit-Cost Analysis

Use following formulas if needed:

Uniform Series

$$(F/A, i, N) = \{(1 + i)^N - 1\}/i$$

$$(P/A, i, N) = \{(1 + i)^N - 1\}/\{i(1 + i)^N\}$$

