

Student I.D. \_\_\_\_\_

Economics 527  
Environmental Economics  
Department of Economics  
Spring 2004  
10:30-11:25  
Friday, Feb. 27, 2004  
E. W. Nafziger  
Derby Food Court 134  
1<sup>st</sup> One-Hour Examination

Fill out your answer card with a number 2 pencil with the best response among the options, indicating student ID number and answers for the 16 multiple-choice questions. Note that the 16 multiple-choice questions count 48 points, the first essay (#17) counts 27 points, and the last essay 25 points. Allocate your time carefully.

1. Sandra Postel is pessimistic about the earth's carrying capacity because of which of the following factors.
  - a. Economic growth commands more resources, humans are destroying the resource base, income inequality is growing, population is increasing, and technological improvements are accelerating.
  - b. Economic growth commands more resources, humans are destroying the resource base, income inequality is growing, population is increasing, and technological improvements are decelerating.
  - c. Economic growth commands more resources, humans are destroying the resource base, income inequality is growing, population is declining, and technological improvements are decelerating.
  - d. Economic growth commands more resources, humans are regenerating the resource base, income inequality is growing, population is increasing, and technological improvements are decelerating.
  - e. Economic growth replenishes resources, humans are destroying the resource base, income inequality is growing, population is increasing, and technological improvements are decelerating.
  
2. Which of the following is a reason why conventional microeconomic principles can not be used to study the allocation of environmental and natural resources.
  - a. Economies do not use the market for allocating the environment and resources.
  - b. Environmental and natural resources are more likely to be private goods.
  - c. Many decisions involving the environment are reversible.
  - d. Market failure is important in analyzing the environment.
  - e. Microeconomics is often dynamic, neglecting implications of decisions for the future.
  
3. Which of the following is true of population growth in the last half of the twentieth century?

- a. Population growth accelerated since 1970.
  - b. Population growth decelerated since 1970.
  - c. Population growth, 1950-2000, was faster than for any other 50-year period.
  - d. Both *a* and *c* are correct.
  - e. Both *b* and *c* are correct.
4. What were some of the problems associated with high yielding varieties of rice in Asia?
- a. The adverse environmental side effects of pesticides.
  - b. A fall in the terms of trade for rice in world markets.
  - c. A fall in yields with constant inputs in the 1990s.
  - d. Increased insect and disease infestations with irrigated land intensification.
  - e. All of the above are correct.
5. According to the Bolivian poor campesinas seen in the video, their illiteracy initially gave rise to a lack of
- a. knowledge.
  - b. self-respect.
  - c. understanding how the world works.
  - d. all of the above.
  - a. none of the above.
6. Which of the following would an economist similar to Vilfredo Pareto ask when analyzing the causes and consequences of environmental degradation?
- a. Can we make anyone better off without making someone else worse off?
  - b. Can we make the poor better off?
  - c. Can we make the rich better off?
  - d. Who reaps the benefits? Who bears the costs? Why are the winners able to impose costs on the losers?
  - e. None of the above is correct.
7. John Rawls supports inequalities as just if they result in
- a. acceleration of economic growth.
  - b. an increase in gross national product.
  - c. compensating benefits for the rest of the population.
  - d. no one being better off while someone else is worse off.
8. According to the graph in our textbook, since 1990 world grain production per person has
- a. decreased
  - b. increased
  - c. stayed the same.
9. For Robert Solow, sustainability is dependent on
- a. centralized planning of natural resources.

- b. deregulation of natural resource use.
- c. every generation leaving all species of animals on earth undiminished.
- d. maintaining the stock of coal and petroleum.
- e. substitutability for natural resources.

10. What are some of the principal forms of environmental degradation that adversely affect health and productivity in developing countries?

- a. hazardous wastes, reduced biodiversity, reduced carbon emissions, and soil degradation.
- b. hazardous wastes, reduced biodiversity, reduced carbon emissions, and water pollution.
- c. hazardous wastes, reduced biodiversity, soil degradation, and water pollution.
- d. hazardous wastes, reduced carbon emissions, soil degradation, and water pollution.
- e. reduced biodiversity, reduced carbon emissions, soil degradation, and water pollution.

11. In which of the following ways was Malthus's population theory wrong in explaining Western population growth? Malthus underestimated all four of the following items:

- a. capital accumulation, technical progress, the potential for famine, and increases in cultivated land.
- b. capital accumulation, technical progress, the potential for famine, and people using contraceptives.
- c. capital accumulation, technical progress, increases in cultivated land, and people using contraceptives.
- d. capital accumulation, the potential for famine, increases in cultivated land, and people using contraceptives.
- e. technical progress, the potential for famine, increases in cultivated land, and people using contraceptives.

12. Which of the following is not an example of Garrett Hardin's "tragedy of the commons"?

- a. Businesses and individuals overpollute the atmosphere.
- b. Farmers drain the Ogallala Aquifer underground reservoir.
- c. Herders' cattle overgraze a pasture open to villagers' cattle.
- d. Sears invests too little in improving marketing.
- e. Shoppers find no parking where merchants provide free parking.

13. Why would population continue to grow for several decades after a population reaches a replacement-level fertility?

- a. because of the high level of fertility.
- b. because of the high level of mortality.
- c. because of the old population.
- d. because of the young population.

14. Shadow prices are used by

- a. business people to increase commercial profitability.
- b. consumers to calculate marginal utility.
- c. planners to calculate social net benefit.
- d. resource buyers to determine whether to buy.
- e. None of the above is correct.

15. The late Julian Simon believed that

- a. government has a major role in population policy.
- b. inventions fall as population grows.
- c. population growth will outstrip the growth in the food supply.
- d. population growth will stimulate per capita output growth.
- e. None of the above is correct.

16. The reasons for the change in developing-country population growth from the first half of the twentieth century to the last half of the twentieth century are

- a. a birth rate falling faster than the death rate.
- b. a death rate falling faster than the birth rate.
- c. a death rate rising while the birth rate falls.
- d. a death rate rising while the birth rate remains constant.
- e. a death rate rising while the birth rate rises.

Student I.D. \_\_\_\_\_  
Name \_\_\_\_\_

Essay question (27 points) – you can write on both the front and the back of this sheet.

17. Describe and evaluate Deborah and Frank Poppers' views concerning the Great Plains and the vision of the Buffalo Commons. Support your answer with at least some evidence given in the Buffalo Commons presentation.

Student I.D. \_\_\_\_\_  
Name \_\_\_\_\_

Essay question (25 points) – you can write on both the front and the back of this sheet.

18. How do economic development (that is, the growth in average income) and the rate of population growth interact with each other? Discuss.

Key 1<sup>st</sup> one-hour exam. 1. B. Sandra Postel is pessimistic about the earth's carrying capacity because of which of the following factors. b. Economic growth commands more resources, humans are destroying the resource base, income inequality is growing, population is increasing, and technological improvements are decelerating. 2. D. Which of the following is a reason why conventional microeconomic principles can not be used to study the allocation of environmental and natural resources. D. Market failure is important in analyzing the environment. 3. E. Which of the following is true of population growth in the last half of the twentieth century? E. Both *b* (population growth decelerated since 1970) and *c* (population growth, 1950-2000, was faster than for any other 50-year period) are correct. 4. E. What were some of the problems associated with high yielding varieties of rice in Asia? e. All of the above (the adverse environmental side effects of pesticides, a fall in the terms of trade for rice in world markets, a fall in yields with constant inputs in the 1990s, and increased insect and disease infestations with irrigated land intensification) are correct. 5. D. According to the Bolivian poor *campesinas* seen in the video, their illiteracy initially gave rise to a lack of d. all (knowledge, self-respect, and understanding how the world works) of the above. 6. A. Which of the following would an economist similar to Vilfredo Pareto ask when analyzing the causes and consequences of environmental degradation? a. Can we make anyone better off without making someone else worse off? 7. C. John Rawls supports inequalities as just if they result in c. compensating benefits for the rest of the population. 8. A. According to the graph in our textbook, since 1990 world grain production per person has a. decreased. 9. E. For Robert Solow, sustainability is dependent on E. substitutability for natural resources. 10. C. What are some of the principal forms of environmental degradation that adversely affect health and productivity in developing countries? c. hazardous wastes, reduced biodiversity, soil degradation, and water pollution. 11. C. In which of the following ways was Malthus's population theory wrong in explaining Western population growth? Malthus underestimated all four of the following items: c. capital accumulation, technical progress, increases in cultivated land, and people using contraceptives. 12. D. Which of the following is not an example of Garrett Hardin's "tragedy of the commons"? d. Sears invests too little in improving marketing. (All the other responses--Businesses and individuals overpollute the atmosphere; Farmers drain the Ogallala Aquifer underground reservoir; Herders' cattle overgraze a pasture open to villagers' cattle; and Shoppers find no parking where merchants provide free parking—are examples of the "tragedy of the commons.") 13. D. Thirteen. Why would population continue to grow for several decades after a population reaches a replacement-level fertility? d. because of the young population. 14. C. Shadow prices are used by c. planners to calculate social net benefit. 15. D. The late Julian Simon believed that d. population growth will stimulate per capita output growth. 16. B. The reasons for the change in developing-country population growth from the first half of the twentieth century to the last half of the twentieth century are b. a death rate falling faster than the birth rate.

Student I.D. \_\_\_\_\_

Economics 527  
Environmental Economics  
Department of Economics  
Spring 2004  
10:30-11:25  
Friday, March 19, 2003  
E. W. Nafziger  
Derby Food 134  
2<sup>nd</sup> One-Hour Exam

Fill out your answer card with a number 2 pencil, indicating student ID number and answers for the 16 multiple-choice questions. Note that the 16 multiple-choice questions count 48 points, question # 17 (essay) counts 27 points, and question # 18 (essay) counts 25 points. Allocate your time carefully. Fill the circle completely for the letter that corresponds to the *best* answer.

1. According to economist Theodore Panayotou, pollution is excessive when
  - a. air and water are dirty.
  - b. firms are not forced to internalize social costs.
  - c. government interferes in the firms' market.
  - d. pollution reduces the quality of air, fresh water, or ground water.
  - e. both **a** and **d** are true.
  
2. The principle which contributes to problems a city faces when it abolishes parking meters during the Christmas shopping rush is
  - a. internalizing externalities.
  - b. irreversible consumption of goods.
  - c. reducing congestable goods.
  - d. reducing transactions costs.
  - e. the tragedy of the commons.
  
3. A water shortage results from a price
  - a. corresponding to an excess demand for water.
  - b. corresponding to an excess supply of water.
  - c. equal to the equilibrium price.
  - d. in excess of the equilibrium price.
  - e. none of the above is correct.

4. Which of the following scholars stated the following: "Ultimately environmental damage can be traced to distorted markets and policy failures."

- a. Ronald Coase.
- b. Herman Daly.
- c. Wes Jackson.
- d. Theodore Panayotou.
- e. Sandra Postel.

5. Which of the following is **not** a part of the views of Wes Jackson?

- a. Belief in a biocentric approach.
- b. Ownership rights must be well defined.
- c. Science needs to be holistic.
- d. Self-interest is harmful.
- e. Small communities are the ideal.

6. In Thailand and Indonesia, some farmers use scarce irrigation water wastefully while other farmers in the same irrigation system suffer from water shortages and unreliable supplies. What type of approach does Theodore Panayotou suggest to solve this environmental problem?

- a. Eliminate market distortions that spur overuse of water.
- b. Increase the number of water monitors on the wasteful farms.
- c. State should assume ownership and management of the irrigation system.
- d. Reduce the prices that farmers pay for using irrigation water.
- e. None of the above is correct.

7. Peasants in Nepal denuded the forest on the mountain slopes because of

- a. excessively individualized property rights.
- b. insecure use rights.
- c. overpricing of user rights.
- d. positive cost advantages or spillovers.
- e. under use of free goods.

8. In the video on Costa Rica, Juan Martinez-Alier argues that struggles to cope with environmental problems take place because

- a. environmental organizations lack the competence to manage change.
- b. misguided government intervention increases the number of spillovers.
- c. state policy does not compel firms to internalize negative externalities.
- d. the state spends too much money on frivolous projects that have no effect on the environment.
- e. transactions costs of enforcing environmental regulations are too high.

9. Panayotou has the following view concerning economic growth and the environment:

- a. People should be charged for their negative spillovers.
- b. Society should maximize gross national product.
- c. Society should minimize environmental degradation and resource depletion.
- d. The state should use subsidies to reduce environmental degradation.
- e. None of the above is correct.

10. Erin Brockovich's view of environmental policy is that

- a. society should regulate and enforce regulations to reduce pollution.
- b. the state should subsidize expensive energy.
- c. the state should tax producers to pay full social cost.
- d. both **b** and **c** are correct.



e. none of the above is correct.

11. The views of the majority of Kansas State University economists are closest to those of

- a. Herman Daly.
- b. Wes Jackson.
- c. Denice Meadows.
- d. Sandra Postel.
- e. Robert Solow.

12. One way of using market forces to make the social costs of using an automobile equal to social benefits in highly-congested cities such as Singapore is

- a. making gasoline expensive by raising the tax.
- b. making public transportation free.
- c. requiring an expensive license to use an automobile.
- d. all of the above are correct.
- e. none of the above are correct.

13. What is Wes Jackson's view on the role of the market in environmental decisions?

- a. An invisible hand leads to the betterment of all.
- b. Establishing markets for land, air, and water is wrong.
- c. Markets produce efficient outcomes if property rights are defined clearly.
- d. Markets produce efficient outcomes with government taxes and subsidies.
- e. None of the above is correct.

14. Four of the following five are views that are held by Wes Jackson. Circle the one answer of the following five that does not belong.

- a. Farmers in Kansas should grow perennials in polyculture.
- b. Humankind needs to adjust to the upcoming end of fossil fuel.
- c. Individuals exploit common property like an infinite discount rate.
- d. Population growth is a major contributor to environmental degradation.
- e. Science should be evolutionary and dialectical.

15. An example of an environmental public good, which is characterized by nonrivalry in consumption, is

- a. a baseball field.
- b. a clover field.
- c. a lighthouse.
- d. All of the above are correct.
- e. None of the above is correct.

16. Which of the following discount (interest) rate is more likely to result in specie extinction?

- a. a high discount rate.
- b. a low discount rate.
- c. a negative discount rate.
- d. a zero discount rate.

Student I.D. \_\_\_\_\_

Name \_\_\_\_\_

Essay question (27 points) – you can write on both the front and the back of this sheet.

17. Theodore Panayotou contends that “Ultimately, excessive environmental damage can be traced to ‘bad’ economics.” Discuss what Panayotou means by this statement, how accurate his view is, and what the policy implications of this view is.

Student I.D. \_\_\_\_\_  
Name \_\_\_\_\_

Essay question (25 points) – you can write on both the front and the back of this sheet.

18. Discuss and evaluate Wes Jackson's critique of the "green markets" approach of mainstream economics.

Key to 2<sup>nd</sup> exam: (Environmental Economics Econ 527 1030 MWF) 1. B. According to economist Theodore Panayotou, pollution is excessive when b. firms are not forced to internalize social costs. 2. E. The principle which contributes to problems a city faces when it abolishes parking meters during the Christmas shopping rush is e. the tragedy of the commons. 3. A. A water shortage results from a price a. corresponding to an excess demand for water. 4. D. Which of the following scholars stated the following: "Ultimately environmental damage can be traced to distorted markets and policy failures." d. Theodore Panayotou. 5. B. Which of the following is **not** a part of the views of Wes Jackson? b. Ownership rights must be well defined. (Belief in a biocentric approach; Science needs to be holistic; Self-interest is harmful; and Small communities are the ideal are part of Jackson's views). 6. A. In Thailand and Indonesia, some farmers use scarce irrigation water wastefully while other farmers in the same irrigation system suffer from water shortages and unreliable supplies. What type of approach does Panayotou suggest to solve this environmental problem? a. Eliminate market distortions that spur overuse of water. (Panayotou, p. 8). 7. B. Peasants in Nepal denuded the forest on the mountain slopes because of b. insecure use rights. 8. C. In the video on Costa Rica, Juan Martinez-Alier argues that struggles to cope with environmental problems take place because c. state policy does not compel firms to internalize negative externalities. 9. A. Panayotou has the following view concerning economic growth and the environment: a. People should be charged for their negative spillovers. 10. A. 10. Erin Brockovich's view of environmental policy is that a. society should regulate and enforce regulations to reduce pollution. 11. E. The views of the majority of Kansas State University economists are closest to those of e. Robert Solow. 12. D. One way of using market forces to make the social costs of using an automobile equal to social benefits in highly-congested cities such as Singapore is d. all of the above (making gasoline expensive by raising the tax, making public transportation free, requiring an expensive license to use an automobile) are correct. 13. B. What is Wes Jackson's view on the role of the market in environmental decisions? b. Establishing markets for land, air, and water is wrong. 14. C Four of the following five are views that are held by Wes Jackson. Circle the one answer of the following five that does not belong. c. Individuals exploit common property like an infinite discount rate. The following do belong (Farmers in Kansas should grow perennials in polyculture; Humankind needs to adjust to the upcoming end of fossil fuel; Population growth is a major contributor to environmental degradation; Science should be evolutionary and dialectical. 15. C. An example of an environmental public good, which is characterized by nonrivalry in consumption, is c. a lighthouse. [A baseball field is not characterized by nonrivalry in consumption.] 16. A. Which of the following discount (interest) rate is more likely to result in specie extinction? a. a high discount rate.

Student I.D. \_\_\_\_\_

Economics 527  
Environmental Economics  
Department of Economics  
Spring 2004  
10:30-11:25  
Wednesday, May 5, 2004  
E. W. Nafziger  
Derby Food 134  
One-Hour Exam

Fill out your answer card with a number 2 pencil, indicating student ID number and

answers for the 33 multiple-choice questions. Note that each of the 33 multiple-choice questions counts 3 points plus 1 free point are equal to 100 points. Allocate your time carefully. Fill the circle completely for the letter that corresponds to the best answer.

1. Which of the following discount (interest) rate is more likely to result in the degradation of Yellowstone National Park?
  - a. a high discount rate.
  - b. a low discount rate.
  - c. a negative discount rate.
  - d. a zero discount rate.
  
2. What is the relationship between suspended particulate matter (SPM) and national GDP per capita? [Note that low income refers to most African economies; middle income to most Latin American economies; and high income to the United States and Western Europe.]
  - a. SPM increases with increased GDP per capita from low-income to middle-income levels and increases with looser government restrictions from increased GDP per capita from middle-income levels to high income levels.
  - b. SPM increases with increased GDP per capita from low-income to middle-income levels and falls with tighter government restrictions from increased GDP per capita from middle-income levels to high income levels.
  - c. SPM falls with increased GDP per capita from low-income to middle-income levels and increases with looser government restrictions from increased GDP per capita from middle-income levels to high income levels.
  - d. SPM falls with increased GDP per capita from low-income to middle-income levels and falls with looser government restrictions from increased GDP per capita from middle-income levels to high income levels.

3. Scientists expect that global climate change during the 21<sup>st</sup> century will
  - a. make Kansas's climate become more like Oklahoma's today.
  - b. move wheat production to Mexico.
  - c. lower sea level.
  - d. reduce temperatures in Kansas.
  - e. reduce tropical cyclones in Bangladesh.
4. The least-cost method of abating greenhouse gases internationally is through
  - a. limiting emissions to 1990 levels.
  - b. stabilizing average temperatures at 1990 levels.
  - c. tradeable emission permits.
  - d. data are lacking to choose between these three alternatives.
5. In Loma Alta, Ecuador, the community reduced deforestation by
  - a. inviting ranchers to use land.
  - b. preventing Panama hat production.
  - c. preventing timber sales outside the community.
  - d. All of the above are correct.
  - e. None of the above is correct.
6. The value of the forests of Loma Alta included
  - a. growing Panama hat fiber.
  - b. increasing groundwater for neighboring areas.
  - c. preventing soil erosion.
  - d. providing habitat for wildlife.
  - e. All of the above are correct.
7. Economists can estimate the demand curve for visits to Yosemite National Park by
  - a. changes in visitors as the cost of admission is varied each month of the year.
  - b. the cost of travel by visitors from various communities.
  - c. the total number of visitors from various communities relative to their population.
  - d. Both a and c are correct.
  - e. Both b and c are correct.
8. The economic value of saving a life considers the discounted value of
  - a. future production potential.
  - b. medical costs of illness.
  - c. wages lost.
  - d. All of the above are correct.

9. A water shortage results from a price
- corresponding to an excess demand for water.
  - corresponding to an excess supply of water.
  - higher than the equilibrium price.
  - lower than the equilibrium price.
  - Both a and d are correct
10. The purpose of the Kyoto Protocol, signed in 1992, was to reduce
- greenhouse gases through cutting CFC production.
  - greenhouse gases through cutting CO<sub>2</sub> production.
  - ozone depletion through cutting CFC production.
  - ozone depletion through cutting CO<sub>2</sub> production.
  - None of the above is true.
11. Which of the following indicates the proportion of annual emissions of carbon dioxide?
- High income countries emit about 10 percent of the total and developing (middle and low income) countries about 90 percent of the total.
  - High income countries emit about 90 percent of the total and developing (middle and low income) countries about 10 percent of the total.
  - High income countries emit about half of the total and developing (middle and low income) countries about half of the total.
  - None of the above is correct.
12. What is the meaning of anthropocentric? An anthropocentric view
- attributes greater value to other species than to humans.
  - attributes intrinsic value to non-human species.
  - attributes no value to non-human species.
  - values species according to their ability to satisfy humans.
  - None of the above is correct.
13. What arguments would support the rich industrialized countries paying for Madagascar to preserve its tropical rainforests?
- preservation of biodiversity.
  - preservation of the Punjabi Aquifer.
  - sequestration of carbon dioxide.
  - Both a and c are correct.
  - None of the above is correct.

14. The increase in CO<sub>2</sub> concentration in the last 50 years or so is a result of
- burning of fossil fuels.
  - groundwater depletion.
  - planting of new forests.
  - Both a and b are correct.
  - Both a and c are correct.
15. Four of the following include at least one example of nature's "free services" consumed by the human economy. Which one of the following includes only examples of the destruction of nature's "free services" consumed by the human economy?
- destruction of the honeybee's ecosystem, forest fires in Indonesia, increasing buffer areas of native trees, and reducing the planet's number of plant species.
  - destruction of the honeybee's ecosystem, forest fires in Indonesia, increasing buffer areas of native trees, and replacing a forest watershed with a plantation.
  - destruction of the honeybee's ecosystem, forest fires in Indonesia, reducing the planet's number of plant species, and replacing a forest watershed with a plantation.
  - destruction of the honeybee's ecosystem, increasing buffer areas of native trees, reducing the planet's number of plant species, and replacing a forest watershed with a plantation.
  - forest fires in Indonesia, increasing buffer areas of native trees, reducing the planet's number of plant species, and replacing a forest watershed with a plantation.
16. According to David Norman, biotechnology, the application of biology to human use, includes
- ability to modify proteins by "protein engineering," moving DNA and genes from one organism to another, and plant and animal breeding.
  - ability to modify proteins by "protein engineering," moving DNA and genes from one organism to another, and use of enzymes in food processing.
  - ability to modify proteins by "protein engineering," plant and animal breeding, and use of enzymes in food processing.
  - moving DNA and genes from one organism to another, plant and animal breeding, and use of enzymes in food processing.
  - All of the above are correct.
17. Genetic engineering refers to
- in-vitro multiplication or regeneration of plant material in the laboratory.
  - the fermentation processes for drink and food
  - the insertion of specific "traits" artificially into other organisms.
  - the use of identifying markers associated with specific characteristics.
  - None of the above is correct.



18. Which of the following will increase the US's GNP?
- Cleaning up an oil spill.
  - Cutting trees and selling timber.
  - Medical costs resulting from air pollution.
  - Shifting from bicycles to autos.
  - All of the above are correct.
19. The Genuine Progress Indicator (GPI) per capita for the United States
- fell for about two centuries, then rose from 1976 to 2002.
  - fell for the two centuries through 2002.
  - rose for about two centuries, then declined from 1976 to 1992.
  - rose for the two centuries through 2002.
20. The World Bank subtracts all of the following except one from gross domestic savings to get adjusted net savings. Which of the following is not subtracted to get adjusted net savings?
- Carbon dioxide damage.
  - Consumption of fixed capital.
  - Education expenditure.
  - Energy depletion.
  - Mineral depletion.
21. Which of the following argument is that of Herman Daly?
- Division of labor and economies of large-scale production increase as markets expand. As population size rises, the supply of and demand for inventions increase.
  - Humans directly use or destroy about 25 percent of the earth's net primary productivity. Doubling humans' share twice is unsustainable.
  - If society defines property rights clearly, then markets will produce efficient outcomes.
  - Sustainability doesn't require that any particular species be preserved. We know that one kind of input can be substituted for another in production.
  - Ultimately, excessive environmental damage can be traced to "bad" economics stemming from misguided government policies and distorted markets.
22. Critics criticize the study, *The Limits to Growth*, by scholars at MIT, for
- assuming agricultural needs grow slower than technical progress.
  - assuming population growth is zero.
  - discussing population and resources by region.
  - putting no limits on technical progress.
  - using proven reserves for long-term projections.

23. According to Marc Breslow, author of the article on the people of the United States as gluttons for energy, what are some of the reasons for market failure in the US energy market?
- the federal government subsidizes fossil and nuclear fuel.
  - the market erects barriers to conservation investment.
  - monopoly power in energy products blocks optimal purchases.
  - the price of fuels fail to reflect harm to the environment.
  - All of the above are correct.
24. A steady state involves
- an increase in inputs without technological progress.
  - growth resulting from population growth.
  - high rates of profit.
  - net new investment and technological progress.
  - no net new investment and no increase in output.
25. The city government of Kansas City wishes to minimize the social cost associated with factories' emission of suspended particulate matter. What decision making rule should the city government of Kansas City use?
- Put into place polices to continue to reduce pollution emissions by one ton per year until the average reduction in the dollar cost of these emissions to humans, materials, buildings, animals, and ecosystems equals the average increase in abatement cost.
  - Put into place polices to continue to reduce pollution emissions by one ton per year until the marginal reduction in the dollar cost of these emissions to humans, materials, buildings, animals, and ecosystems equals the marginal increase in abatement cost.
  - Put into place polices to continue to reduce pollution emissions by one ton per year until the marginal reduction in the dollar cost of these emissions to humans, materials, buildings, animals, and ecosystems exceeds the marginal increase in abatement cost.
  - Put into place polices to continue to reduce pollution emissions by one ton per year until the marginal reduction in the dollar cost of these emissions to humans, materials, buildings, animals, and ecosystems is less than the marginal increase in abatement cost.
  - Put into place polices to continue to reduce pollution emissions by one ton per year until the total dollar cost of these emissions to humans, materials, buildings, animals, and ecosystems equals the total abatement cost.
26. In Ecuador the law established land-tenure rights for rural peasant communities. The example of Loma Alta indicates that the Loma Alta community
- can create institutions to reduce commercial use of open-access resources.
  - cannot prevent degradation and destruction of open-access resources.
  - cannot prevent the "tragedy of the commons" without individual ownership.
  - cannot restrict excessive community commercial use of open-access resources.

27. Which of the following are not social costs to be added to the private cost of a gasoline-powered vehicles?
- a. carbon emissions.
  - b. ozone pollution.
  - c. resource depletion.
  - d. traffic jams.
  - e. none of the above.
28. In Loma Alta, Ecuador, researchers convinced local community members that deforestation had
- a. increased soil erosion.
  - b. reduced cattle production .
  - c. reduced the water supply.
  - d. both a and b are correct.
  - e. both a and c are correct.
29. According to economists, which of the following areas is expected to be most vulnerable to a continuation of global warming and related climate changes throughout the 21<sup>st</sup> century?
- a. Canada.
  - b. Europe.
  - c. Russia.
  - d. the South.
  - e. the US.
30. According to Professor Dustin Becker, evaluating a forest according to its total economic value means including
- a. existence value, such as the preservation of songbirds.
  - b. indirect value, such as the contribution to watershed protection.
  - c. optional value, such as the potential from tourism.
  - d. all of the above are correct.
  - e. none of the above is correct.
31. An example of a trade-off diagram would be
- a. Net monetary costs compared to reduced days of illnesses.
  - b. Net monetary costs compared to reduced medical costs.
  - c. Net monetary costs compared to increased days of illnesses.
  - d. Net monetary costs compared to increased medical costs.
  - e. Both a and b are correct.

32. For Daly, the limiting factor in economic development is

- a. entrepreneurship
- b. human skills
- c. natural capital
- d. physical capital

33. Most scientists think that the major contributors to the increase in global atmospheric temperature in the last seventy years have been

- a. factories and forests.
- b. factories and pets.
- c. factories and vehicles.
- d. forests and pets.
- e. forests and vehicles.

Key 5.5.4 one-hour exam. 1. A. Which of the following discount (interest) rate is more likely to result in the degradation of Yellowstone National Park? a. a high discount rate. 2. B. What is the relationship between suspended particulate matter (SPM) and national GDP per capita? [Note that low income refers to most African economies; middle income to most Latin American economies; and high income to the United States and Western Europe.] b. SPM increases with increased GDP per capita from low-income to middle-income levels and falls with tighter government restrictions from increased GDP per capita from middle-income levels to high income levels. 3. A. Scientists expect that global climate change during the 21<sup>st</sup> century will e. make Kansas's climate become more like Oklahoma's today. 4. C. The least-cost method of abating greenhouse gases internationally is through c. tradeable emission permits. 5. C. In Loma Alta, Ecuador, the community reduced deforestation by c. preventing timber sales outside the community.. 6. E. The value of the forests of Loma Alta

included e. All of the above (growing Panama hat fiber, increasing groundwater for neighboring areas, preventing soil erosion, and providing habitat for wildlife) are correct. 7. E. Economists can estimate the demand curve for visits to Yosemite National Park by e. Both b and c (the cost of travel by visitors from various communities, and the total number of visitors from various communities relative to their population) are correct. (Monthly change in visitors is wrong, as other things are not equal, say, between January and July.) 8. D. The economic value of saving a life considers the discounted value of e. All of the above (future production potential, medical costs of illness, and wages lost) are correct. 9. E. A water shortage results from a price e. Both a (corresponding to an excess demand for water).and d (lower than the equilibrium price) are correct. 10. B. The purpose of the Kyoto Protocol, signed in 1992, was to reduce b. greenhouse gases through cutting CO<sub>2</sub> production. 11. C. Which of the following indicates the proportion of annual emissions of carbon dioxide? c. High income countries emit about half of the total and developing countries about half of the total. [See part of handout in annex at end of the key.] 12. D. What is the meaning of anthropocentric? An anthropocentric view d. values species according to their ability to satisfy humans. 13. D. What arguments would support the rich industrialized countries paying for Madagascar to preserve its tropical rainforests? d. Both a and c (preservation of biodiversity, and sequestration of carbon dioxide) are correct. 14. A. The increase in CO<sub>2</sub> concentration in the last 50 years or so is a result of a. burning of fossil fuels. 15. C. Four of the following include at least one example of nature's "free services" consumed by the human economy. Which one of the following includes only examples of the destruction of nature's "free services" consumed by the human economy? c. destruction of the honeybee's ecosystem, forest fires in Indonesia, reducing the planet's number of plant species, and replacing a forest watershed with a plantation. 16. E. According to David Norman, biotechnology, the application of biology to human use, includes e. All of the above (a. ability to modify proteins by "protein engineering," moving DNA and genes from one organism to another, and plant and animal breeding; b.

ability to modify proteins by “protein engineering,” moving DNA and genes from one organism to another, and use of enzymes in food processing; c. ability to modify proteins by “protein engineering,” plant and animal breeding, and use of enzymes in food processing; and d. moving DNA and genes from one organism to another, plant and animal breeding, and use of enzymes in food processing.) are correct. 17. C. Genetic engineering refers to c. the insertion of specific “traits” artificially into other organisms. 18. E. Which of the following will increase the US’s GNP? e. All of the above (Cleaning up an oil spill; Cutting trees and selling timber; Medical costs resulting from air pollution; and Shifting from bicycles to autos) are correct. 19. C. The Genuine Progress Indicator (GPI) per capita for the United States c. rose for about two centuries, then declined from 1976 to 1992. 20. C. The World Bank subtracts all of the following except one from gross domestic savings to get adjusted net savings. Which of the following is *not* subtracted to get adjusted net savings? c. Education expenditure is not subtracted but is added. All the others (Carbon dioxide damage, Consumption of fixed capital, Education expenditure, Energy depletion, and Mineral depletion) are subtracted. 21. B. Which of the following argument is that of Herman Daly? b. Humans directly use or destroy about 25 percent of the earth’s net primary productivity. Doubling humans’ share twice is unsustainable. 22. E. Critics criticize the study, *The Limits to Growth*, by scholars at MIT, for e. using proven reserves for long-term projections. 23. E. According to Marc Breslow, what are some of the reasons for market failure in the US energy market? e. All of the above (the federal government subsidizes fossil and nuclear fuel; the market erects barriers to conservation investment; monopoly power in energy products blocks optimal purchases; and the price of fuels fail to reflect harm to the environment) are correct. 24. E. A steady state involves e. no net new investment and no increase in output. 25. B. The city government of Kansas City wishes to minimize the social cost associated with factories’ emission of suspended particulate matter. What decision making rule should the city government of Kansas City use? b. Put into place policies to continue to reduce pollution emissions by one ton per year until the marginal reduction in the dollar cost of these emissions to humans, materials, buildings, animals, and ecosystems equals the marginal increase in abatement cost. 26. A. In Ecuador the law established land-tenure rights for rural peasant communities. The example of Loma Alta indicates that the Loma Alta community a. can create institutions to reduce commercial use of open-access resources 27. E. Which of the following are *not* social costs to be added to the private cost of a gasoline-powered vehicles? e. none of the above (carbon emissions, ozone pollution, resource depletion, traffic jams are social costs added to the private cost of a gasoline-powered vehicle. 28. E. In Loma Alta, Ecuador, researchers convinced local community members that deforestation had e both *a* (increased soil erosion) and *c* (reduced the water supply) are correct. 29. D. According to economists, which of the following areas is expected to be most vulnerable to a continuation of global warming and related climate changes throughout the 21<sup>st</sup> century? d. the South. 30. D. According to Professor Dustin Becker, evaluating a forest according to its total economic value means including d. all of the above (existence value, such as the preservation of songbirds; indirect value, such as the contribution to watershed protection; and optional value, such as the potential from tourism) are correct. 31. E. An example of a trade-off diagram would be e. Both *a* (Net monetary costs compared to reduced days of illnesses) and *b* (Net monetary costs compared to reduced medical costs) are correct. 32. C. For Daly, the limiting factor in economic development is c. natural capital. 33. C. Most scientists think that the major contributors to the increase in global atmospheric temperature in the last seventy years have been c. factories and vehicles.

## ANNEX

Table handed out in class. Share of the World’s Total Carbon Dioxide Emissions 1999 (%)

By income level: High income	48.2;	Middle income	35.2;	Low income	10.3;	Other
	5.6.					

Student I.D. \_\_\_\_\_

Economics 527  
Environmental Economics  
Department of Economics  
Spring 2004  
10:30-11:25  
Friday, May 21, 2004  
E. W. Nafziger  
Derby Food 134  
Final Exam

Fill out your answer card with a number 2 pencil, indicating student ID number and answers for the 11 multiple-choice questions. Note that the 11 multiple-choice questions count 44 points. For multiple choice, fill the circle completely for the letter that corresponds to the *best* answer.

You are to choose 4 of the 5 essay questions, #12-16, each of which counts 14 points, with the total 56 points.

Allocate your time carefully.

1. Georgesco-Roegen thinks that human species will leave a short life because of
  - a. a lack of labor inputs into the production process.
  - b. low entropy of the economic process.
  - c. our increased depletion of mineral deposits to produce luxuries.
  - d. None of the above is correct.
  
2. While more than one-third of Ghana was covered with natural forest in 1900, in 2003 only 5 percent of the country remains forested? What policies might have contributed to this deforestation? [You don't need to know what policies did contribute to deforestation but only what policies could have contributed to this deforestation.]
  - a. Ghana's forestry department spent too little on reforestation.
  - b. Logging and treecropping were unprofitable because Ghana's currency (cedi) was overvalued.
  - c. Poverty spurred rural families to increase the forest's use for fuelwood.
  - d. Property rights for using the forest are not clear.
  - e. All of the above are true.
  
3. A failed or shadow state
  - a. is a state defeated in war.
  - b. is a state experiencing environmental degradation.
  - c. is a state not recognized by any other state.
  - d. provides a bureaucracy and protection for its population.
  - e. provides only minimal public goods to the population.

4. Dutch disease refers to revenues from booming primary products that

- a. appreciate the home currency.
- b. increase incentives to export other goods.
- c. increase import substitution.
- d. lower factor prices for other home goods.
- e. None of the above is correct.

5. According to Renner, resource-based wars are unlike traditional wars in that with resources wars

- a. an objective is to maintain conditions conducive to resource looting.
- b. an objective is to permit activities that otherwise would be criminal.
- c. the bulk of violence is directed against civilians.
- d. the most important revenue source is the illicit sale of natural resources.
- e. All of the above are correct.

6. Daly and Cobb's Index of Sustainable Economic Welfare (ISEW) per capita

- a. adds environmental damage and resource depletion to gross product.
- b. adds the import of goods and services from abroad to gross product.
- c. subtracts environmental damage and resource depletion from gross product.
- d. subtracts the gain of leisure time from gross product.
- e. subtracts the services of government capital from gross product.

7. Why do many economists advocate substituting a tax on fossil fuels for income taxes in the United States?

- a. the poor would pay a lower percentage of their income in taxes
- b. the tax would reduce incentives to degrade the environment
- c. the tax burden would shift toward those protecting the environment
- d. none of the answers above is true

8. What would happen to the market for petroleum, with the passage of a tax proportional to carbon emissions?

- a. price would decrease and quantity demanded would fall
- b. price would decrease and quantity demanded would rise
- c. price would increase and quantity demanded would fall
- d. price would increase and quantity demanded would rise
- e. price would not be affected

9. In the following equation on investment criteria for projects where the environment is an important issue, identify the meaning of V, B, C, r, and T:

$$V = B_0 - C_0 + \frac{B_1 - C_1}{(1+r)} + \frac{B_2 - C_2}{(1+r)^2} + \dots + \frac{B_T - C_T}{(1+r)^T} = \sum_{t=0}^T \frac{B_t - C_t}{(1+r)^t}$$

- a. V is net present value, B is social benefits, C is social costs, and r is the rate of natural resource depletion.
- b. V is net present value, B is social benefits, C is social costs, and t is the life of the investment project.
  - c. V is net present value, B is social benefits, r is the rate of natural resource depletion, and t is the life of the investment project.
  - d. V is net present value, B is social benefits, C is social costs, r is the rate of natural resource depletion, and t is the life of the investment project.
  - e. None of the above is correct.

10. You are an absentee landlord for a house in a major urban center right next to a factory that was spewing forth nitrogen dioxide. The factory eliminates nitrogen dioxide pollution for one year. How would your interests be affected?

- a. Your health improves.
- b. Your housing price increases.
- c. You miss fewer days of work.
- d. All of the above are correct.
- e. one of the above is correct.

11. Which of the following is the rate of extinction of species, according to John Tuxhill?

- a. The natural rate of specie extinction is about 5 species per year; presently the rate of extinction is about 30-50 per year.
  - b. The natural rate of specie extinction is about 5 species per year; presently the rate of extinction is about several hundred per year.
  - c. The natural rate of specie extinction is about several hundred species per year; presently the rate of extinction is about 5 per year.
  - d. The natural rate of specie extinction is about several hundred species per year; presently the rate of extinction is about several hundred per year.
  - e. None of the above is correct.



Essay portion - #12-16 (Choose 4 of the following 5 essay questions.)

Student I.D. \_\_\_\_\_

Name \_\_\_\_\_

Essay question (14 points) – you can write on both the front and the back of this sheet.

12. (14 points). Discuss whether you think that the benefits of agricultural biotechnology outweigh the risks.

Student I.D. \_\_\_\_\_  
Name \_\_\_\_\_

Essay question (14 points) – you can write on both the front and the back of this sheet.

13. (14 points). How, if at all, does the availability of mineral resources and the degradation of the environment affect or is affected by war and political conflict in developing countries? Discuss.

Student I.D. \_\_\_\_\_  
Name \_\_\_\_\_

Essay question (14 points) – you can write on both the front and the back of this sheet.

14. (14 points) Princeton economist and New York Times columnist Paul Krugman believes that energy resources are going to remain somewhat scarce and expensive for the foreseeable future. He, however, does not expect that humankind will run out of energy resources in the immediate future. Do you agree with Krugman's views concerning energy resources. Discuss.

Student I.D. \_\_\_\_\_  
Name \_\_\_\_\_

Essay question (14 points) – you can write on both the front and the back of this sheet.

15. (14 points) Manhattan city and Riley County are discussing whether to allow wind farms as energy sources in the area. Discuss whether you think Manhattan city and Riley County should allow wind farms; and indicate your reasons.

Student I.D. \_\_\_\_\_  
Name \_\_\_\_\_

Essay question (14 points) – you can write on both the front and the back of this sheet.

16. (14 points) Indicate what, if any, international agreement would be best to cope with the increasing emissions of carbon into the earth's atmosphere? Discuss.

Key Environ Econ 5.21.4 exam

1. C. Georgescu-Roegen thinks that human species will leave a short life because of C. our increased depletion of mineral deposits to produce luxuries. 2. E. While more than one-third of Ghana was covered with natural forest in 1900, in 2003 only 5 percent of the country remains forested? What policies might have contributed to this deforestation? [You don't need to know what policies did contribute to deforestation but only what policies could have contributed to this deforestation.] e. All of the above (Ghana's forestry department spent too little on reforestation, Logging and treecropping were unprofitable because Ghana's currency (cedi) was overvalued, Poverty spurred rural families to increase the forest's use for fuelwood, and Property rights for using the forest are not clear) are true. 3. E. A failed or shadow state e. provides only minimal public goods to the population. 4. A. Dutch disease refers to revenues from booming primary products that a. appreciate the home currency. 5. E. Five. According to Renner, resource-based wars are unlike traditional wars in that with resources wars e. All of the above (an objective is to maintain conditions conducive to resource looting, an objective is to permit activities that otherwise would be criminal, the bulk of violence is directed against civilians, and the most important revenue source is the illicit sale of natural resources) are correct. 6. C. 15. Daly and Cobb's Index of Sustainable Economic Welfare (ISEW) per capita c. subtracts environmental damage and resource depletion from gross product. 7. B. Why do many economists advocate substituting a tax on fossil fuels for income taxes in the United States? b. the tax would reduce incentives to degrade the environment. 8. C. What would happen to the market for petroleum, with the passage of a tax proportional to carbon emissions? c. price would increase and quantity demanded would fall. 9. E. e. In the following equation on investment criteria for projects where the environment is an important issue, identify the meaning of V, B, C, r, and T. [equation is net present value, which cannot be reproduced for e-mail transmission] e. None of the above is correct, since r is the rate of interest NOT natural resource depletion, and t is time, NOT the life of the investment project. 10. B. You are an absentee landlord for a house in a major urban center right next to a factory that was spewing forth nitrogen dioxide. The factory eliminates nitrogen dioxide pollution for one year. How would your interests be affected? b. Your housing price increases. 11. B. Which of the following is the rate of extinction of species, according to John Tuxhill? b. The natural rate of specie extinction is about 5 species per year; presently the rate of extinction is about several hundred per year.