

EnvS 001, Sections 4 and 5: Introduction to Environmental Issues
Spring 2009

FINAL EXAM REVIEW SHEET

Below, you will find a list of the material that will be the basis for the Final Exam, as well as typical questions that will be found on the exam.

Material Covered

- Water Resources: Quantity and Quality
- Air Resources: Ozone Hole, Global Warming, Pollution
- Energy Resources: Conventional and Sustainable
- Sustainable Living
- Videos: *Kilowatt Ours*
- Video: *Global Warming: Signs and Science*
- Lectures: My lectures since Midterm 2

Exam includes all readings as given on the Greensheet

I. Water Resources

- How much of the earth's water is available to us as fresh water?
- What four processes results in water cycling through the hydrologic cycle?
- What is an aquifer? Draw a diagram showing the connection between surface waters and different aquifer types.
- Describe how we make fresh water available to areas of water scarcity.
- In areas, such as Santa Clara County, where groundwater is removed, what is an unexpected side effect of that groundwater removal? What are we doing in Santa Clara County to address this problem?
- What and where is the Ogallala aquifer? Why is it being drained?
- What are the benefits and disadvantages of dams and reservoirs?
- What three sectors compete for fresh water in the U.S.? Which one uses the most water?
- What are four sustainable approaches to solving water use problems?
- According to Miller and Spoolman, what seven strategies must be implemented to achieve a more sustainable water future?

II. Air Resources

- What is the troposphere and where is it located?
- What are the major constituents of the atmosphere and in what percentages do they occur naturally? Name three minor constituents.
- What are the three major problems facing air resources? All three are attributable to the same general human activity. What is this activity?
- What federal law regulates air quality, what is the regulating agency and what are two regulated air pollutants?
- What are the major outdoor air pollutants?
- What is acid precipitation, how does it form and why is it a problem?
- What are the health effects of air pollution?

- One approach to controlling emissions is a strategy called emissions trading. Describe how this principle works with factories that emit a pollutant for which there is a regulatory standard.
- What is the ozone hole and why is it a problem?
- Describe the reaction between CFC and an ozone molecule.
- How has the problem of ozone loss been handled by the international community?
- What is the greenhouse effect and why is it important?
- What are the now unavoidable effects of global warming of 2 °C. What additional potentially avoidable effects would occur with warming to 3 °C? What would occur at 4 °C?
- What can be done to combat our contribution to global warming? Discuss adaptation, emissions reduction, and CO₂ removal from the atmosphere.
- How does the problem of ozone loss differ from global warming?

III. Energy Resources

- What is net energy? What percent of energy is wasted unnecessarily?
- What three factors should be considered when determining what energy sources to use to meet our national energy needs?
- Discuss the pros and cons of oil as a primary energy source.
- Nuclear energy may be making a comeback as an energy source. What issues have discouraged Americans from building any new reactors for the last 30 years?
- Which of the four nonrenewable energy resources used in the US is actually abundant here? What are the pros and cons of depending on this resource?
- What is energy efficiency? What are the efficiencies of florescent and incandescent light bulbs?
- What measures can be taken to make transportation more efficient?
- What percentage of US oil consumption is due to transportation? What percentage of US oil is imported?
- What measures can be taken to make buildings more efficient?
- By the year 2050, how much of the U.S. energy needs could come from renewable resources and what are those resources?
- What is passive solar heating versus active solar heating?
- What are the pros and cons of hydrogen as an energy source?
- What do you think is the most promising renewable energy resource for the future and why?
- How much energy per capita do California customers use, on average, compared to the average per capita use of Americans?
- What important steps can we take *as individuals* to move our society toward a more sustainable energy future?

IV. Sustainable Living in an Urban World

- What percentage of the world's population lives in urban centers now compared to 1850? What factors draw people to cities?

- In the US, what percentage of the population lives in urban and suburban areas compared to the mid 1800s? How have US cities changed in quality over this period?
- What is urban sprawl, what factors contribute to it, and what are the problems?
- Concentrating people in cities has some advantages. What are they?
- Most cities are unsustainable. Discuss this problem in terms of cities' ecological footprints and material inputs and outputs.
- What is smart growth and how can it be used to protect natural areas in and near urban centers? What is new urbanism and how does it promote sustainability?
- What are the characteristics of eco-cities? Describe the ecovillage movement.
- What portion of urban land worldwide is devoted to automobile related usage? What portion in the US?
- What are 3 ways to reduce automobile use?
- What the advantages and disadvantages of bicycles, mass transit rail, buses, and rapid rail?
- How can you live more sustainably in your urban environment?