



*"Investing in Africa's Future"*

## **FACULTY OF AGRICULTURE AND NATURAL RESOURCES**

**ANR201: ENVIRONMENTAL SCIENCE AND POLLUTION**

**END OF FIRST SEMESTER EXAMINATIONS**

**NOVEMBER/DECEMBER 2016**

**LECTURER: PROFESSOR F. TAGWIRA**

**DURATION: (3HRS)**

### ***INSTRUCTIONS***

1. Do Not Write Your Name On The Answer Sheets.
2. Use Answer Sheets Provided.
3. Begin Your Answer For Each Question On A New Page.
4. Credit Is Given For Neat Presentation Of Answers.





## ANR201 ENVIRONMENTAL SCIENCE AND POLLUTION

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THIS PAPER HAS THREE SECTIONS. ANSWER ALL QUESTIONS IN SECTION A AND B AND TWO QUESTIONS FROM C

### SECTION A:

Answer all questions in this section. Each question is worth two marks.

1. A sustainable society
  - a. manages its economy and population size without doing irreparable environmental harm.
  - b. satisfies the needs of its people without depleting Earth capital.
  - c. protects the prospects of future generations of humans and other species.
  - d. works with other countries.
  - e. all of the above.
2. We can extend use of nonrenewable resources by
  - a. reducing direct consumption of the resource.
  - b. reusing the same form of a particular resource many times.
  - c. recycling a resource into new products.
  - d. finding substitutes for a resource.
  - e. all of the above.
3. Resources that are called nonrenewable
  - a. are also called perpetual resources.
  - b. are only resources that are alive.
  - c. are capable of economic depletion.
  - d. b and c.
  - e. none of the above.
4. Which of the following statements BEST illustrates the tragedy of the commons?
  - a. A factory pollutes a river as much as the law allows.
  - b. Some levels of pollution are life threatening.
  - c. Some activities harm the environment, but others do not.
  - d. Irrigated cropland can be ruined by salinization.
  - e. People who walk on the commons ruin the grass.
5. Which of the following statements does not characterize relationships between hunter-gatherers and the environment?
  - a. They were nomadic.
  - b. They exploited their environment for food and other resources.
  - c. They were experts in survival and had a great understanding of nature.
  - d. Population size reflected food availability.
  - e. They caused major environmental impacts.



6. Which of the following statements about the greenhouse effect is FALSE?
- The amount of heat trapped in the troposphere depends on concentrations of greenhouse gases.
  - The greenhouse effect is a new theory that explains warming of the atmosphere.
  - Heat trapped by greenhouse gases keeps the planet warm enough for life.
  - The two predominant greenhouse gases are water vapor and carbon dioxide.
  - The United States is the largest emitter of all greenhouse gases.
7. The major greenhouse gases include all of the following EXCEPT
- chlorofluorocarbons (CFCs).
  - carbon dioxide and water vapor.
  - sulfur dioxide.
  - ozone.
  - methane.
  - nitrous oxide.
8. Increased greenhouse gases originate from
- burning fossil fuels.
  - agriculture.
  - use of CFCs.
  - deforestation.
  - all of the above.
9. In biological amplification,
- organisms in the lower trophic levels accumulate lethal doses of toxins.
  - the animals at the upper end of a food chain receive lower doses than those below.
  - organisms at higher trophic levels have more concentrated levels of toxic substances.
  - the environment has higher concentrations of toxins than organisms in the food chain.
  - the toxic substances reach maximum accumulation in one of the intermediate levels of a food chain.
10. Landfill liners will eventually leak because liners can be
- ripped by burrowing animals.
  - punctured during installation.
  - dissolved by chemical solvents.
  - none of the above.
  - all of the above.
11. Urban areas tend to alter climate by all of the following means EXCEPT
- generating heat.
  - absorbing heat.
  - obstructing wind.
  - reducing tropospheric ozone.
  - causing faster rainfall run-off.



12. The quality of urban life could be improved by all of the following transportation strategies EXCEPT
- charging single-occupant vehicles higher fees for tolls and parking.
  - raising gasoline taxes and car registration fees.
  - establishing a high-speed rail trust fund.
  - using gas taxes for mass transit.
  - charging bikers for the construction of bike paths.
13. Steps that are biological in nature that can help reduce the destruction and degradation of tropical forests include all of the following EXCEPT
- funding the Rapid Assessment Program.
  - setting aside large areas of the world's tropical forests as reserves and parks.
  - using debt-for-nature swaps and conservation easements.
  - discouraging family planning programs.
  - rehabilitating degraded tropical forests.

## SECTION B:

Answer all questions in this section.

1. Explain what you understand by: (14)
  - a. Local Agenda 21
  - b. CITES
  - c. Greening of multilateral lending institution
  - d. Bioremediation
  - e. Brundtland commission
  - f. Montreal Protocol
  - g. Bamako convention
2. Explain what you understand about the Solar Hydrogen age. How will that help to reduce pollution and what are its advantages? (10)
3. If you were hired to improve the environmental outlook of Africa University. Explain some of the things you would change to make the institution more environmentally friendly. (10)

## SECTION C.

Answer any two questions from this section.

1. Increased urban population and poverty are major problems causing a crisis of sustainability in most African cities. One of the biggest problems is in the area of waste management. Explain the various approaches that could be used to solve this problem. (20)
2. Poverty and population growth are major driving forces of environmental degradation. Explain the linkages between the above and soil erosion,

deforestation and loss of biodiversity. What are the environmental consequences of each of the above and what national strategies should be taken to solve these problems? (20)

- 3a. Explain fully the concept of ozone depletion and why the hole is greater in regions close to arctic and antarctica. (9)
- 3b. Why is agriculture considered a major contributor to global warming? (8)
- 3c. Give the percentage radiative forcing of each of the following gases.
- Carbon dioxide
  - Methane
  - Nitrous oxide
- (3)

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