**ESCUELA SUPERIOR POLITÉCNICA DEL LITORAL**

**FACULTAD DE CIENCIAS NATURALES Y MATEMÁTICAS**

**DEPARTAMENTO DE CIENCIAS QUIMICAS Y AMBIENTALES**

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| **COMPROMISO DE HONOR**  Yo, ………………………………………………………………………………………………………………..…………… al firmar este compromiso, reconozco que el presente examen está diseñado para ser resuelto de manera individual, que puedo usar una calculadora *ordinaria* para cálculos aritméticos, un lápiz o esferográfico; que solo puedo comunicarme con la persona responsable de la recepción del examen; y, cualquier instrumento de comunicación que hubiere traído, debo apagarlo y depositarlo en la parte anterior del aula, junto con algún otro material que se encuentre acompañándolo. No debo además, consultar libros, notas, ni apuntes adicionales a las que se entreguen en esta evaluación. Los temas debo desarrollarlos de manera ordenada.  ***Firmo al pie del presente compromiso, como constancia de haber leído y aceptar la declaración anterior.***  "Como estudiante de ESPOL me comprometo a combatir la mediocridad y actuar con honestidad, por eso no copio ni dejo copiar".  **Firma *NÚMERO DE MATRÍCULA:……………….…. PARALELO:…………*** |

***Vocabulary*** – Match the term on the left hand side with the correct definition on the right hand side (**1 point each = 20 points**). Write the correct letter next to the correct term.

**Part I (A-J only)**

1 - \_\_\_\_ Conductivity **A** – a measure of all of the salts dissolved in water

2 - \_\_\_\_ Total dissolved solids **B** – section of atmosphere that includes all living organisms

3 - \_\_\_\_ Salinity **C** – area that contains 75% of the gases of the atmosphere

4 - \_\_\_\_ pH **D** – measures the ability of water to conduct electricity

5 -\_\_\_\_ Dissolved O2 **E** – atmospheric layer that is the coldest & protects from meteors

6 - \_\_\_\_ Biosphere **F** – a measure that includes dissolved salts, minerals, and metals

7 - \_\_\_\_ Troposphere **G** – section of atmosphere that includes the ozone layer

8 - \_\_\_\_ Stratosphere **H** – this measure affects the ability of fish to breathe

9 - \_\_\_\_ Mesosphere **I** – section of atmosphere that absorbs UV & X-ray radiation

10 - \_\_\_\_ Ionosphere **J** – has a range of 0 to 14

**Part II (K-T only)**

11 -\_\_\_\_ Particulate Matter **K –** wastewater generated by flushing of toilets

12 -\_\_\_\_Compounds **L –** general term used for solid pieces & liquid droplets in the atmosphere

13 -\_\_\_\_ Toxic Metals **M –** contamination generated by halogens, nitrogens, sulfurs & carbonates

14 -\_\_\_\_ Photochemical oxidants **N –** a form of bioaccumulation that causes problems in marine life

15 -\_\_\_\_ Hydrocarbons **O –** lowers water’s pH & caused by the increase in CO2 in the atmosphere

16 -\_\_\_\_ Eutrophication **P –** watewater generated by cleaning food, using a sink, washing clothes

17 -\_\_\_\_ Acidification **Q –** excessive accumulation of nutrients in water (especially N & P)

18 -\_\_\_\_ Black Water **R –** includes oxides of nitrogen & volatile organic contaminants

19 -\_\_\_\_ Grey Water **S –** air contamination that includes lead, chromium & arsenic

20 -\_\_\_\_ Heavy metals in fish **T –** Caused by incomplete combustión of organic material

***Definitions*** – in your own words, define each term completely, give an example, and explain why the measurement is important to the quality of water **(5 points - 2.5 each)**

1 –– Turbidity –

2 –– Aquatic Macroinvertebrates –

***Multiple Choice –*** Read each statement carefully and circle the most complete answer **(1 point each = 5 points)**

1. During the Exxon Valdez oil spill

1. More than 100 million gallons of oil poisoned & killed large amounts of plants
2. More than 10 million gallons of oil poisoned & killed large amounts of plants
3. More than 10 million gallons of oil poisoned & killed large amounts of marine mammals & birds
4. Led to the implemention of laws that banned single hull ships
5. Both C & D

2. The Chernobyl disaster occurred when

A. a nuclear power reactor exploded in India and released 400 times more radiation than an atomic bomb

B. a nuclear reactor was shutdown in Ukraine and released 400 times more radiation than an atomic bomb

C. a pesticide plant in India accidentally released deadly cianide gas & killed thousands

D. a pesticide plant in Russia accidentally released deadly cianide gas & killed thousands

3. The Union Carbide Bhopal disaster occurred when

A. a nuclear power reactor exploded in India and released 400 times more radiation than an atomic bomb

B. a nuclear reactor was shutdown in Russia and released 400 times more radiation than an atomic bomb

C. a pesticide plant in India accidentally released deadly cianide gas & killed thousands

D. a pesticide plant in Russia accidentally released deadly cianide gas & killed thousands

4. Minamata disease was

A. discovered in 1956, includes convulsions in humans and is caused by mercury poisoning

B. discovered in 1966, includes convulsions in humans and is caused by mercury poisoning

C. discovered in 1976, includes uncontrollable movements in humans and is caused by lead poisoning

5. Kyoto is

A. a terrible environmental disaster that occured in Japan in the 1990s and killed millions of marine birds

B. an international protocol that requires participating countries to reduce greenhouse gas emissions

C. an environmental disaster that lead to the international treaty to limit use of agricultural pesticides

***Short Answer***– Respond to questions or statements in numbers 1-7 completely to receive full credit **(50 points)**

1 – Explain what causes acid rain, how it forms and its impacts on aquatic, terrestrial & forest ecosystems. **(5 points)**

2 – Draw the earth’s wáter cycle and label each part of your diagram. **(5 points)**

3 – Draw a diagram of the destruction of ozone particles by CFCs. Be sure to label each part and show what is happening in the chemical reactions. **(5 points)**

4 – Draw a diagram of the earth`s atmosphere, label each of the five parts of the atmosphere, and provide one piece of information about each level. **(10 points)**

5 – There are 9 Planetary Limits identified in the textbook. Choose one of the 9 and identify the planetary limit, explain the problem of the limit and discuss observations that have been made about it. **(5 points)**

6 – Define Global Warming, identify two causes of global warming, and explain two consequences of a warmer planet **(10 points).**

7 – Define ecological footprint and explain the different ways one can measure the impacts on wáter, soil, air, and the environment in general. What can humans do to limit their ecological footprint? **(10 points)**

***Short Essay:*** **(20 points).** One of the course objectives for Ecologia is for students to *“develop an environmental ethic of your own and create a vision of your ecological future as each relates to and can be utilized in your profession and personal life.”*

In a 3-paragraph essay, discuss your environmental ethic and your vision for your ecological future. That is,

* How do you view your life on the earth as it relates to the environment?
* What kind of ecological future do you want to see in the world and in your life?
* How does what you learned impact how you think about your chosen career?
* How will you integrate what you learned in this class in your daily personal and professional life?

Be sure to give **specific** examples from the course (topics, themes, places you’ve visited, your community, readings, activities, etc.).