

	ESCUELA SUPERIOR POLITÉCNICA DEL LITORAL FACULTAD DE CIENCIAS NATURALES Y MATEMÁTICAS DEPARTAMENTO DE CIENCIAS QUÍMICAS Y AMBIENTALES	
	Año Académico: 2017 – 2018	Semestre: II
	Materia: Introducción a la Gestión Ambiental	Profesor:
Evaluación: Tercera	Fecha: 23 febrero 2018	
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 <i>ordinaria</i> 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:.....		

TOPIC I. CRITICAL KNOWLEDGE ANALYSIS (20 points): In each item write the correct answer that corresponds to the blank space that is underlined in each item.

1. An organism that uses the process of photosynthesis to produce nutrients and organic matter is called
2. An ecosystem that owns animals and plants characteristic of that site and average levels of specific precipitation and temperature is called
3. To name a species considered as PRODUCTIONER at the trophic levels that could be found in the Polytechnic Campus (Protector Forest)
4. Is it a REFORESTATION or AFORESTATION technique to plant pine trees in the Andean Moorland of Ecuador?
5. What is the trophic level of the following species that live in the ecosystems of the Guayaquil area?

Species	White-tailed deer	Parakeet	Ceibo
Trophic level			

6. Every ecosystem is the sum of BIOTOPO and BIOCENOSIS. From the following list, place in the appropriate table place. The list includes LORO, PLANCTON, MINERALS.

BIOTOPO	
BIOCENOSIS	

7. Mention an example of a cultural ecosystem service:
8. The Protective Forest Prosperina to what type of Biome belongs:

9. Sum of the different species (plants, animals and microorganisms) living in a specific ecosystem is the concept of:
10. Name an Ecuadorian biome that has a low temperature:

TOPIC II (20 points): In the far right column, type the literal that corresponds to the correct term.

A	JUNGLE OR TROPICAL FOREST	Relations between individuals in a community or biocenosis.	
B	BIOTOPO	It extends from the low tide line to the final edge of the continental shelf.	
C	PH OF SEA WATER	That individual who is capable of making his own food.	
D	LITORAL ZONE	CFCs, HCFCs, Halons, HBFCs.	
E	SPECIES IN DANGER	They are those that can be extinguished if a critical factor if its environment changes.	
F	AUTOTROPH ORGANISM	It has temperatures between 25 ° C and 27 ° C in average, with precipitation of approximately 1900 mm per year.	
G	NOX	The process of photosynthesis is used to maintain primary production and encourage synthesis reactions across the food chain.	
H	ECOSYSTEM SERVICE: POPULATION DYNAMICS	They are those that have a small number of members in immediate danger of extinction.	
I	PH OF FRESHWATER WATER BODIES WITH ABUNDANT CO ₂	It extends from the high tide line to the low tide line.	
J	PRAIRIE	Plant and animal species that live in the bottom of water masses or between submerged vegetation. Some are sessile and some are freely mobilized.	
K	THREATENED SPECIES	They are all the individuals of an ecosystem and the interactions that happen between them both at intra-specific and inter-specific level.	
L	SUBLITORAL ZONE	Relationships between individuals of the same population.	
M	INTRA-SPECIFIC RELATIONSHIP	The PH is in an approximate range of 5.5 – 6.5	
N	BENTOS	They are macroscopic vegetable and animal species, which move without depending on aquatic currents.	
O	OZONE-DEPLETING SUBSTANCES	It is evident in pollination, in ecosystems for fertilization of plants, reproduction of individuals and maintenance of habitats.	
P	BIOCENOSIS	They are hydrocarbons, precursors of the ozone troposférico. The engine of internal combustion reaches port with their approximately 45 % in the air.	
Q	ECOSYSTEM SERVICE: ENERGY'S FLOW	The values range between 7.5 and 8.4.	
R	INTER-SPECIFIC RELATIONSHIP	It can be an aquatic or terrestrial way like a rock, cave, trees where individuals live with set of abiotic factors.	
S	VOCs	In full oxidation give the color brownish to smog; They form at high temperatures during combustion processes; Under incomplete combustion last fractions of seconds (75% becomes).	
T	NECTON	It is a biome that possesses annual precipitations in 250 and 750 mm, with very hot summer weather and not so rainy winters.	

TOPIC III USE OF CONCEPTS (10 points): Identify in each element of the table its closest relationship with one of the following concepts: Biocenosis (B), Biotope (BT), population (P), community (C), Ecosystem (E), Ecosystem Service (SE), Ecological niche (N), Habitat (H).

Wetland		Herd of elephants	
Groups of deer and squirrels		Climate regulation	
Carnations in a garden		Weather	
Pollination		Stem of a fallen tree	
Domestic dogs at home		Carbon sink	

TOPIC IV THEORETICAL KNOWLEDGE (50 points): Mark the correct answer that corresponds to each item in the **RESPONSE SECTION TOPIC IV (at the end of this topic)**.

1. The atmosphere for its study is divided into layers. What are these layers?

- A. Mesosphere, stratosphere and thermosphere or ionosphere
- B. Stratosphere, thermosphere or ionosphere and mesosphere
- C. Troposphere, stratosphere, mesosphere and thermosphere or ionosphere
- D. Stratosphere and mesosphere.

2. The air primary pollutants are:

- A. Particulate matter, Nitrogen Oxides (NOX), Sulfur Compounds (SOX, H₂S), Carbonated Compounds (COX, CH₄), Volatile Organic Compounds (VOCs - solvents and hydrocarbons)
- B. Acid Rain, Smog, Asbestos Radon, PVC
- C. Trichloroethane, Methyl Bromide, Tetrachloride, Halons
- D. CFC, HCFC, Tropospheric Ozone, Benzene, Toluene

3. What is carbon footprint and how is it measure?

- A. The carbon footprint is a statement of the impact that the human being has on the environment. It has metric units of tons / individual.
- B. The carbon footprint is the measure of the impact of human activities on the environment and is determined by the amount of GHG emissions produced, measured in units of carbon dioxide equivalent.
- C. Carbon footprint is one of the simplest ways to measure environmental impacts and pollution generated by companies.
- D. The carbon footprint measures the amount of land area and volume of water needed according to our lifestyle.

4. Determine the correct concept of emissions of an air pollutant

- A. Discharge of a contaminant into the atmosphere from a mobile or fixed source. Measured as milligram of contaminant per m³ of air under normal conditions.
- B. It is the allowable limit of a pollutant in the breathable air. Measured as microgram of contaminant per m³ of air.
- C. Discharge of a pollutant into the atmosphere whose allowable limit does not affect the air we breathe.
- D. Discharge of liquid contaminants to the gaseous phase that affect air measured per unit area.

5. What is the definition of water pollution?

- A. Presence in the water of chemicals that could cause harm to living beings.
- B. Absence of dissolved oxygen as a result of excess phytoplankton in the water.
- C. Presence in the water of organic matter that could cause damage to living beings.
- D. Qualitative state (quality) of water defined by the presence of impurities or "dirt" in the liquid that could cause damage to the health of living beings.

6. Which of the following examples is considered a punctual discharge in water bodies?

- A. Release of contaminants from the bottom of water bodies.
- B. Wastewater discharge.
- C. Infiltration from contaminated areas.
- D. Transport of contaminants from growing areas.

7. The physical-chemical parameters that usually detect water contamination are:

- A. Temperature, dissolved oxygen, pH, suspended solids.
- B. Temperature, nutrients, pH, suspended solids, pesticides.
- C. Heavy metals, dissolved oxygen, hydrocarbons, suspended solids, coliform bacteria.
- D. Pesticides, hydrocarbons, pH, suspended solids, coliform bacteria.

8. A BIO - INDICATOR is a:

- A. An organism that is resistant to pollution, its presence and quantity determines how healthy the aquatic ecosystem is.
- B. Saprophytic organisms with a low presence in the aquatic ecosystem indicate a high rate of contamination
- C. An organism that is sensitive to pollution and its presence and quantity determines how healthy the aquatic ecosystem is.
- D. Aquatic insects with a high presence in the aquatic ecosystem indicate high pollution rate.

9. One of the DISADVANTAGES of alternative treatment of wastewater through oxidation ponds is:

- A. You need sophisticated machinery for your operation.
- B. It occupies large space.
- C. The generation of sludge is continuous and in great quantity.
- D. High operating and maintenance costs.

10. Grey water is:

- A. They are the result of runoff and precipitation.
- B. They are wastewater from discharges from industries.
- C. They are wastewater from tubs, showers, sinks and washing machines, excluding toilets.
- D. They are waste water from toilets.

11. Select the right alternative for the concept of resilience:

- A. Capacity that has a system, be it at the level of individual, a forest, a city or an economy, to generate disturbances and thus can continue its development.
- B. Capacity that has a system, be it at the level of individual, a forest, a city or an economy, to significantly alter its characteristics of structure and functionality due to a disturbance.
- C. Capacity that has a system, be it at the level of individual, a forest, a city or an economy, to face the changes and thus can continue its development.
- D. Capacity that has a system, be it at the level of individual, a forest, a city or an economy, to face changes of the permanent and irreversible type.

12. Wastewater treated can be used to:

- A. Composting.
- B. Obtaining biofuels.
- C. Extraction of biogas.
- D. Irrigation.

13. What kind of relationship exists between biodiversity and resilience in ecosystems?

- A. Inversely proportional.
- B. Directly proportional.
- C. Neutral.
- D. Antagonistic

14. Biomass composed mainly of bacteria, resulting from the biological treatment of waste water is known as:

- A. Muds activated
- B. Primary Sludge
- C. Organic Sludge
- D. Inorganic Sludges

15. In reference to Agenda 21, select the correct option:

- A. Binding and voluntary action plan for nations related to sustainable development.
- B. This Agenda was constituted by 2 sections.
- C. Agenda 21 was promulgated at the Rio Conference, Brazil - 1992.
- D. Agenda 21 was promulgated at the Montreal Conference, Canada - 1989.

16. The main objective of the Montreal Protocol was:

- A. Reduce the emission of greenhouse gases.
- B. Protection of the ozone layer.
- C. Establish the transfer, management and use of living modified organisms through modern biotechnology.
- D. Designate Antarctica as a "natural reserve dedicated to peace and science".

17. Which of the following countries did not ratify the Kyoto Protocol:

- A. Ecuador
- B. U.S
- C. Australia
- D. Japan

18. A mechanism to combat the effects of eutrophication in a reservoir is:

- A. Prohibition of phosphate detergents
- B. Manual withdrawal of aquatic vegetation
- C. Prevention of agricultural runoff
- D. Swamp Control

19. Which of the following is NOT considered a surface water body?

- A. Lakes
- B. Aquifers
- C. Ravines
- D. Wetlands

20. Principal compound for water purification is:

- A. Aluminum sulfate
- B. Potassium
- C. Nitrogen
- D. Lime

21. According to the water footprint, the highest water consumption occurs in:

- A. The industrial sector
- B. The agricultural sector
- C. Related to domestic consumption
- D. In recreation

22. The RAMSAR convention is a protection mechanism for:

- A. Wasteland
- B. Polar ice caps
- C. Wetlands and lowlands
- D. Aquifers

23. According to the Map of Availability of Fresh Water on the Planet, which of the following statements is correct:

- A. Ecuador has a physical water shortage
- B. Ecuador presents stress of physical availability of water
- C. Ecuador presents vulnerability of physical availability of water
- D. Ecuador has little or no physical water shortage

24. How the atmospheric layer is called, where the climatic phenomena occur

- A. Troposphere
- B. Mesosphere
- C. Stratosphere
- D. Ionosphere

25. Gas resulting from incomplete combustion:

- A. Carbon monoxide
- B. Carbon dioxide
- C. Ozone
- D. Nitrogen

26. Which element mainly conforms the air?

- A. Nitrogen
- B. Oxygen
- C. Water vapor
- E. Carbon dioxide

27. is tropospheric ozone harmful to health?

- A. V
- B. F

28. What is NOT a commonly used equipment to control air pollution in the factories?

- A. Sleeve Filter
- B. Cyclone
- C. Electrostatic precipitation
- D. Catalyst

29. What is NOT a type of solar radiation?

- A. Ultraviolet
- B. Visible
- C. Infrared
- D. Albedo

30. At lower atmospheric temperature, the ozone layer is weaker?

- A. V
- B. F

31. When increasing the parts per million of CO₂ in the atmosphere increases the temperature of the planet?

- A. V
- B. F

32. In what range is the pH of the rain?

- A. 0 to 4
- B. 4 to 8
- C. 9-12
- D. 12 to 14

33. In how many degrees centigrade has the planetary temperature increased since the industrial revolution?

- A. 0.1° C
- B. 0.8 ° C
- C. 2° C
- D. 3° C

34. Which of the following is a source of methane emission?

- A. Aforestation
- B. Cattle raising
- C. Overfishing
- D. Deforestation

35. Do greenhouse gases favor human life on earth?

- A. V
- B. F

36. In the environmental disaster that occurred in Chernobyl, Ukraine what type of pollutant was released?

- A. Radioactivity
- B. CFC
- C. Pesticides
- D. DDT

37. What involved the environmental catastrophe called Minamata disease?

- A. Explosion of a nuclear reactor and subsequent fire that emitted a radioactive cloud over 2000 km².
- B. Incident related to the bio-accumulation of methyl mercury in a bay that caused multiple cases of severe neurological syndrome and death.
- C. Uncontrolled emission of methyl isocyanate gases from a Union Carbide pesticide plant that caused more than 6000 deaths
- D. DDT poisoning contained in pesticides to which they are related to sterility.

38. What is the largest oil spill in the ocean?

- A. Exxon Valdez
- B. Shipwreck of the Jessica Ship
- C. Deep Water Horizon Platform
- D. Chevron-Texaco Case

39. What is one of the problems causing eutrophication?

- A. Direct discharge of waste water into water bodies
- B. Discharge of hydrocarbons into water bodies
- C. Acid rain
- D. Use of water for cooling generators

40. Eutrophic water loses transparency due to the excessive presence of:

- A. Zooplankton
- B. Phytoplankton
- C. Fish
- D. Bacterium

41. The abundance of debris generates abundance of decomposing organisms such as bacteria in eutrophic waters, which:

- A. They feed on the nutrients of water
- B. They die due to lack of oxygen in the water
- C. Consume dissolved oxygen from water
- D. They help the growth of phytoplankton

42. The acidification of the oceans is a consequence of:

- A. The increase of the nitrogen gases in the atmosphere
- B. Increased discharges of chemical waste into the coasts
- C. Increased fishing in the coastal zone
- D. The increase of CO₂ in the atmosphere

43. Effects of acidification on the oceans. Indicate which of these statements is FALSE:

- A. It causes changes in the breathing process
- B. Decreases the ability to form shells and exoskeletons
- C. Decreases reproduction processes
- D. Decreases the capacity of aquatic visibility

44. Indicate which of these statements is FALSE:

- A. In the ocean $7.5 > \text{PH} < 8.4$
- B. The formation of weak acids like carbonic acid (H₂CO₃) decreases PH
- C. Acidification of the oceans could affect the availability of sea food affecting the fishing industry and marine biodiversity
- D. Ocean PH is strongly linked to the amount of toxic wastes discharged into the sea

45. Which of the following consumer goods has the highest water footprint? In other words, you need more volume of water per ton of product.

- A. Corn
- B. Rice
- C. Beef
- D. Wheat

46. The atmospheric CO₂ that is in contact with the surface of the ocean.

- A. It dissolves in sea water and reacts with other components to form weak acids
- B. Produce eutrophication of the ocean by introducing carbon in large quantities into the food chain
- C. It does not dissolve in sea water and accumulates causing oxygen depletion in the upper ocean layer
- D. It does not allow sunlight to pass through the deep ocean layers, preventing photosynthesis

47. Indicate which of the following statements is FALSE:

- A. The troposphere is the layer of the Earth's atmosphere that is in contact with the surface of the earth
- B. In the troposphere is 90% of the mass of the whole atmosphere and its thickness is only 10% of the whole atmosphere
- C. In the troposphere is the ozone layer
- D. The ionosphere is used for transmission of radio waves and long distance communications.

48. One of the main causes of the presence of SMOG in the cities is:

- A. The thermal inversion
- B. Acid rain
- C. The loss of biodiversity
- D. The expansion of the agricultural frontier.

49. Which of the following is NOT a strategy to control and reduce SMOG:

- A. Modification of engines to reduce NO_x and SO_x emissions into the atmosphere
- B. Replace current fuels with less polluting ones such as natural gas, alcohol, among others.
- C. Raise taxes on polluting automobiles and punish those who deliberately pollute with high fines.
- D. Disposal of solid waste incinerators.

50. The two atmospheric gases that combine with steam to give way to the formation of acid rain are:

- A. Oxides of Nitrogen and Sulfur Dioxide
- B. Carbon Monoxide and Nitrogen Oxides
- C. VOC and Sulfur Dioxide
- D. Sulfuric Acid and Carbon Monoxide

RESPONSE SECTION TOPIC IV

Questions	ANSWERS			
	A	B	C	D
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