

**SECOND EVALUATION OF ENVIRONMENTAL IMPACT OF PROJECTS (60 PTS)  
I SEMESTER 2012-2013**

NAME:

DATE:

**1. Write the letter according to the concept of each term (10 pts)**

	<b>Term</b>	<b>Concept</b>	
A	Environmental index	Simple measurement that indicate potential changes in the original environment of the evaluated site	
B	Environmental Management Plan	sistematic, periodic, documented, objective revision regarding the practices performed by a specific activity in relation to a series of environmental requirements	
C	Environmental Indicator	determines the focus and methods to be applied in the elaboration of the environmental impact assessments	
D	Scope	It is responsible of the process of EIA in front of the authorities incharged of the application	
E	Magnitude	Potential danger that affects the environmet, ecosystems, population and/or goods	
F	WQI	representative number or a descriptive classification of environmental data	
G	Environmental Risk	results of the EIA, supervision reports, document revision used in an environmental audit	
H	Secondary source information	document that describe in detail and chronologically the actions required to prevent, mitigate, control, correct and compensate the negative environmental impacts	
I	Promotor	change on the environmental component from the original situation (without project) and the final situation (with project)	
J	Environmental Audit	water quality index	

**2. Read the following case and then answer the following question in each case**

**CASE 1 (17 pts)**

A fabric of cement has been working in a industrial area for about 15 yrs. Recently in the last 5 years its production has increased to the double. In the surroundings of this industrial area now is located an urban area, which in the last 2 years has been complaining about the quality of the air in that place. For this reason they ask the Municipality to perform the environmental studies therefore, this the fabric can be closed or controlled according to the results obtained. You are part of the environmental team and you have to indicate the Municipality what is the level of the air quality in the area and the effect it has to the health. You have gone to the fabric surroundings and perform the measurements of some environmental parameters of the air, among them you measured particulate matter and SO<sub>2</sub> with the following results:

SO<sub>2</sub> = 1.32 ppm

Particulate matter (>10 um) = 65 ug/m<sub>3</sub>

- Choose the correct formula (a, b or c). (2 pt)
- Calculate the value of the air quality index for this place. Write your calculation (5 points). (2.5 pt e/o)
- According to the table given below which is the qualitative description of the air quality in this place and what is it impact to the health . (4 pts) (2 pt e/o)
- Which are the sensitive groups. (2 pt) (1 pt e/o)
- Mention two reasons of why environmental indexes are useful (4 pts) (2 pt e/o)

<b>AQI</b>	<b>Level of the quality of the air</b>	<b>Impacto to health</b>
0-50	Good	Good
51-100	Moderate	Moderate
101-150	Alert	Not Good for sensitive groups
151-200	Aware	Bad
201-300	Emergency	Very bad
301-500	Significant harmful	Dangerous

**Possible formulas to be used for calculating the air quality index (CHOOSE the correct one):**

- $AQI_{cont} = AQI_{high}/AQI_{low}$
- $AQI_{cont} = ((AQI_{high} - AQI_{low})/(BP_{high} - BP_{low})) * (C_{cont} - BP_{low}) + AQI_{low}$
- $AQI_{cont} = BP_{high} + BA_{low}$

<b>PM<sub>10</sub> ug/m<sub>3</sub></b>				<b>SO<sub>ppm</sub></b>			
<b>BP low</b>	<b>BP high</b>	<b>AQI low</b>	<b>AQI high</b>	<b>BP alto</b>	<b>BP high</b>	<b>AQI bajo</b>	<b>AQI alto</b>
0	54	0	50	NA	NA	101	150
55	154	51	100	0.65	1.24	201	300
155	254	101	150	1.25	2.04	301	500

$$AQI_{air} = \max (AQI_{MP2.5}, AQI_{NO2}, AQI_{SO2}, AQI_{NO2}, \dots)$$

### CASE 2 (16 pts)

In a local town in Ecuador, in a residential area there is a car vulcanizer. The vulcanizer works 24h/7d. The residents of this area ask the local authority to perform an environmental audit, since they complain about the noise. You are the leader of this audit group. You have performed a series of measurements and samplings during your visit and now you have to present this report to the authority. Based on the results obtained during your measurements and the national legislation you should tell the authorities if this car vulcanizer is not fulfilling the local legislation.

**Table of noise measurements performed during the audit**

Parameter	Noise (dB)	
	06:00-20:00	20:00-06:00
Day 1	50	55
Day 2	49	59
Day 3	48	60
Day 4	48	60
Day 5	47	57

- What will be the Ecuadorian legislation to be followed in order to know if the car vulcanizer fulfill the law or not (2 pts)
- According to the two types of audit mentioned in class, which one are you performing. Explain your answer. (3 pts)
- What will your report say according to the noise levels you have found. Give your conclusions according to your results (4 pt)
- In case the car vulcanizer is not fulfilling the law will you mention in your final report that they are violating the law? Mention two characteristics of the audit report? Exclude the one that refers to legal conclusions (3 pt)
- What type of primary source information are you using in this audit (2 pts)
- Indicate the type of zone (landuse) from the table that you have chosen to determine if they fulfill the law or not (2 pts)

### CASE 3 (17 pts)

In an area close to Manglaralto, (Ecuador) there are a group of important aquifers in this area. This zone is well known since the main activity carry on by the local people is related to agriculture. In order to protect their crops they use two main pesticides RADIN 11 and PESTDIE. Lately, in the last two years they have noticed that the quality of the water in the aquifer has changed. For this reason they asked the local authority to perform the environmental measurements to determine the water quality in the aquifer. A series of samplings have to be performed in order to determine, the Water Quality Index and to know if the admissible levels have been fulfilled or not. According to the tables included and in the local legislation you should determine if the environmental parameters are exceeding the allowed levels or not and calculate the water quality index for underground water.

- What is the name of the underground quality index you will use (2pt)
- Calculate the underground quality index according to the parameters given in your table of information. Use the tables (5 pts)
- Define how is the quality of the underground water (2 pt)
- Determine if the parameters for underground water quality fulfill or not the local legislation and fill the table according to your observations (4 pts) (0.5 e/o)
- According to the results obtained from your analysis, conclude if the water of the acquirer can be used for irrigation or recreation. Why? (4 pts) (2 pt answer, 2 pt explanation)

Variable	Characteristics of the aquifer	Calculation	Value	Quality of the underground water according to table
Conductivity	$4.5 \times 10^{-2}$ cm/s			
Surface soil (<2m)	Arcilla arenosa			
Terrain tilt	3 %			
Depth of the aquifer	4 m			
Recharge	90 mm			
Impact Zone Vadosa	Arena or Grava			
Aquifer environment	Arenisca masiva			
<b>Underground water index</b>				

Parameters	Results of the analysis	Fulfill the admissible limits	Irrigation	Recreation
Bario	355 µg/l			
Cadmio	2.5 µg/l			
Cromo total	15.8 µg/l			
DDD, DDE, DDT	0.015 µg/l			
<b>TO DETERMINE THE USE OF AQUIFER</b>				
Organoclorados (totals)	0.15 mg/l			
pH	6			
Litio	2.3 mg/l			
Molibdeno	0.01 mg/l			
<b>Admissible use of the water of the aquifer: irrigation or recreation</b>				

## CASE 1

Table of results

	Result	
Formula selected		
AQI PM <sub>10</sub>		
AQI SO <sub>2</sub>		
Value considered for the calculation of the AQI <sub>air</sub>		
Level of the quality of the air		
Impact to health		
Sensitive groups		
Reasons to use environmental indexes		

## CASE 2

	Results	
Ecuadorian legislation to be followed		
Type of audit you will carry on		
Conclusions of your audit report according to the noise levels found		
Could you mention in your audit report if the car vulcanizer is violating the law		
Characteristics of the audit report		
Type of primary source information used in the audit		
Type of zone (landuse) used as reference to choose the allowed limits for noise in the table		