

Question 2: Analyze an Environmental Problem and Propose a Solution

10 points

A	Identify the sea surface condition for the eastern equatorial area of the Pacific Ocean illustrated in Figure 1. Acceptable identification point: (Ocean water) cooler than average	Point 01
B	Based on the information in Figure 1, identify the climate phenomenon associated with the sea surface conditions shown in the equatorial area of the Pacific Ocean. Acceptable identification point: La Niña	Point 02
C	Based on the information in Figure 2, describe a difference in climate patterns between the regions A and B. Examples of acceptable responses may include the following: - Region A has an increased chance of precipitation, while Region B has a decreased chance of precipitation. - Region A will be wetter, while Region B will be drier.	Point 03
D	Describe one reason why there is an increased risk of flooding in urban areas during extended periods of precipitation. Examples of acceptable responses may include the following: - Impervious/paved surfaces increase runoff/reduce infiltration/reduce absorption. - Parking lots/roads/buildings/sidewalks increase runoff/reduce infiltration/reduce absorption. - There is less vegetation and, therefore, less infiltration/absorption.	Point 04
E	Propose a realistic solution a city could implement to decrease the risk of flooding in urban areas. Examples of acceptable responses may include the following: - Use permeable pavement - Plant vegetation/establish parks/create rain gardens/build green roofs - Install retention ponds/stormwater basins	Point 05

- F** **Justify** the solution proposed in part E by providing an additional advantage other than a reduction in the risk of flooding. **Point 06**

Examples of acceptable responses may include the following:

Solution from part E	Justification of solution with additional advantages
Use permeable pavement	- Increased recharge of nearby aquifers/groundwater - Decreased pollution in runoff
Plant vegetation/establish parks/create rain gardens/build green roofs	- Vegetation absorbs pollutants - Vegetation stores carbon dioxide/produces oxygen - Decreased erosion - Increased/restored habitat for wildlife - Increased biodiversity - Helps reduce urban heat island effect - Aesthetic enjoyment/improved quality of life - Creates jobs (in landscaping/park maintenance)
Install retention ponds/stormwater basins	- Decreased pollution in runoff - Increased habitat/biodiversity

- G** **Describe** one difference between the climate of a temperate seasonal forest and that of a savanna. **Point 07**

Examples of acceptable responses may include the following:

- Temperate seasonal forests have a cooler climate than a savanna.
- Temperate seasonal forests have a stronger/colder winter than a savanna.
- Temperate seasonal forests have four distinct seasons while savannas do not.
- Temperate seasonal forests receive more annual precipitation than savannas.
- Temperate forests receive precipitation throughout the year while savannas have a rainy season/dry season.

- H** **Identify** the ecological process that occurs following a forest fire that leaves the soil intact. **Point 08**
- Acceptable identification point:
- Secondary succession

I **Describe** one way burning forests contribute to atmospheric pollution. **Point 09**

Acceptable description point:

- Burning of trees releases CO₂/CO/NO_x/particulate matter/VOCs.

J **Describe** one sustainable forestry practice that could be used to reduce the occurrence or severity of forest fires. **Point 10**

Examples of acceptable responses may include the following:

- Prescribed burns can remove excess fuel/dead leaves/underbrush.
 - Brush removal can remove excess fuel/dead leaves/underbrush.
 - Selective cutting can create a fire break.
 - In agroforestry, ground crops that might otherwise be fuel can be harvested/removed.
-