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. **Point 01**

Acceptable identification point:

- (Ocean water) cooler than average

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. **Point 02**

Acceptable identification point:

- La Niña

C Based on the information in Figure 2, **describe** a difference in climate patterns between the regions A and B. **Point 03**

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.

D **Describe** one reason why there is an increased risk of flooding in urban areas during extended periods of precipitation. **Point 04**

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.

E **Propose** a realistic solution a city could implement to decrease the risk of flooding in urban areas. **Point 05**

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

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. Acceptable description point: • Burning of trees releases CO_2/CO/NO_X/particulate matter/VOCs.	**Point 09**
J	**Describe** one sustainable forestry practice that could be used to reduce the occurrence or severity of forest fires. 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.	**Point 10**