Unit 15 · Ecological Imbalances

WORKSHEET

Full marks 39

Name _____ Class _____ Roll no. _____ Date _____ Marks _____ / 39

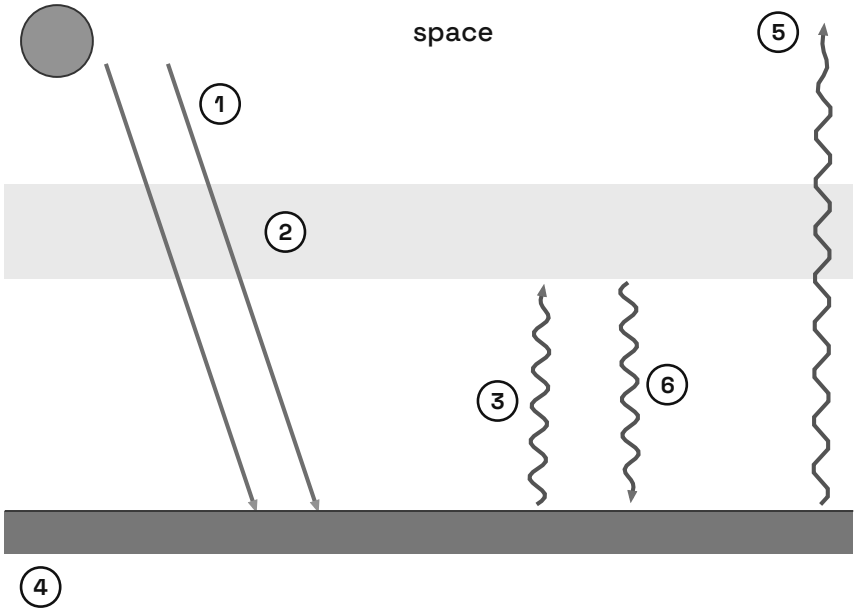
1 Key words [4]

Match each term in column A with its description in column B. Two items in column B are not needed. Each match carries 0.5 mark.

Column A		Column B
1. greenhouse effect	☐	**a.** the warming of the Earth by an enhanced greenhouse effect
2. global warming	☐	**b.** chemicals once used in refrigerators and aerosol sprays that destroy ozone
3. ozone layer	☐	**c.** forests taking carbon dioxide from the air and storing it
4. CFCs	☐	**d.** adding powdered limestone to an acidified lake to neutralize it
5. Montreal Protocol	☐	**e.** an exotic species that spreads on its own and causes harm
6. liming	☐	**f.** greenhouse gases trapping the infrared given out by the Earth's surface
7. carbon sequestration	☐	**g.** the rise of the sea as glaciers melt
8. invasive alien species	☐	**h.** a species that has lived naturally in an area for a long time
		i. the 1987 treaty that phased out ozone-depleting substances
		j. the ozone of the stratosphere that absorbs most of the Sun's UV

2 Label the diagram [3]

The diagram shows the greenhouse effect. Write what belongs in place of 1 to 6. Each carries 0.5 mark.



1. _____ **2.** _____

3. _____ **4.** _____

5. _____ **6.** _____

3 Multiple choice [5]

Choose the correct option for each of the following questions.

i. Which gas is the most abundant greenhouse gas in the atmosphere? [1]

a. carbon dioxide **b.** methane

c. water vapor **d.** nitrous oxide

ii. Which pair of gases is the main cause of acid rain? [1]

a. sulphur dioxide and oxides of nitrogen **b.** carbon dioxide and methane

c. oxygen and nitrogen **d.** ozone and CFCs

iii. Why can a single chlorine atom destroy so many ozone molecules? [1]

a. it reacts with oxygen to make more chlorine

b. it is a catalyst: it is set free again at the end of each cycle and attacks another ozone molecule

c. UV light makes new chlorine atoms from each ozone molecule

d. each chlorine atom splits into many atoms

iv. Why is clean rain slightly acidic even where there is no pollution? [1]

a. it contains sulphuric acid from volcanoes

b. it dissolves carbon dioxide from the air, forming weak carbonic acid

c. the clouds contain nitric acid from lightning

d. water is always acidic

v. Potato came to Nepal from South America and is grown everywhere, but it hasn't spread into the forests on its own. What is it? [1]

a. a native species
b. an exotic species, but not invasive
c. an invasive alien species
d. an endemic species

4 Very short answers [3]

Write very short answers to the following questions.

a. What would the Earth's average surface temperature be without any greenhouse gases? [1]

b. Name two of Nepal's invasive plants that are among the world's 100 worst invasive species. [1]

c. Why is a halon from a fire extinguisher especially harmful to the ozone layer? [1]

5 Short answers [9]

Write short answers to the following questions.

a. "The greenhouse effect traps the sunlight." Correct this statement and explain. [2]

b. Why is Venus hotter than Mercury, though Mercury is closer to the Sun? [2]

c. The marble and limestone of old temples are wearing away where the air is polluted. Explain why, with an equation. [2]

d. List three features that make invasive species stronger competitors than native species. **[3]**

6 Numerical problems **[4]**

Solve the following problem. Show your working.

At Mauna Loa, carbon dioxide in the air was 316 parts per million (ppm) in 1959 and 427 ppm in 2025. Clean rain has a pH of about 5.6; acid rain falling on a lake has a pH of 4.6. i. By how many ppm did carbon dioxide rise? ii. By what percentage did it rise? iii. What was the average rise per year? iv. Each fall of 1 in pH means ten times as acidic. How many times as acidic is the acid rain as clean rain?

Answer:

7 Long answers **[8]**

Write long answers to the following questions.

a. What is ozone layer depletion? Explain how CFCs destroy ozone, with equations, and how the world has acted to stop it. **[4]**

b. *Mikania micrantha* is smothering the forest edges of Chitwan, where rhinos and deer feed. Explain why it spreads so well there, what harm it does, and suggest how it could be managed. **[4]**

8 Think **[3]**

Nepal produces a tiny share of the world's greenhouse gases. Give two ways climate change is already affecting Nepal, and explain why using electric buses and induction stoves cuts emissions more in Nepal than in many other countries.

9 Activity: Invasive plants near you (not marked)

Walk along a roadside, a field edge or a pond near your school. Look for *Lantana* (kirne kanda), *Ageratina* (banmara), *Parthenium* (paati jhar), *Mikania* (lahare banmara) and water hyacinth (jalkumbhi). For each one you find, write where it grows and what grows near it.

Plant	Where it grows	How much (a few, a patch, everywhere)	Native plants near it?

Which of these plants seemed to have pushed other plants out, and why might it have done so?