Mark schemes

Q1.

(a) carbon dioxide **or** acidic gas(es)

allow other named example of acidic gas such as sulfur dioxide

allow chemical formula e.g. SO_2

allow carbon monoxide

allow particulates / smoke / soot

allow methane / CFCs

1

(b) any **three** from:

- fertiliser
  - *allow nitrate / phosphate*
- sewage
  - *allow organic matter / faeces / urine / urea*
- toxic chemicals
  - *allow a named toxic chemical such as mercury **or** sulfur*
  - *dioxide **or** acid rain*
- herbicide
- fungicide
  - *allow insecticide*
  - *allow oil*
  - *allow nuclear waste*
  - *allow other examples of water pollutants*
  - *if herbicide / fungicide / insecticide not given allow (named) pesticide for **1** mark*

3

(c) **Level 2:** Scientifically relevant facts, events or processes are identified and given in detail to form an accurate account.

4–6

Level 1: Facts, events or processes are identified and simply stated but their relevance is not clear.

1–3

No relevant content

0

Indicative content

air pollution:
(carbon dioxide **or** methane **or** greenhouse gases)

- global warming / climate change / traps heat
  - floods / fire / drought **or** ice caps melt **or** rise in sea level **or** extreme weather

- loss of habitat / food
- migration

(acidic gas / named – e.g. SO_2 / NO_x)
- damage to leaves so less photosynthesis
- damage to roots or alters ions in soil (/ e.g. phosphates / iron)
  - (so) less protein manufacture
- damage to lungs
  - breathing difficulties / bronchitis / asthma

(carbon monoxide)
- combines with haemoglobin
  - less oxygen carried (by haemoglobin / blood)

(particulates / 'soot')
- cover leaves **or** block light
  - less photosynthesis so less glucose made
- damage to lungs
  - breathing difficulties / bronchitis / asthma

water pollution:
(sewage)
- bacteria multiply
  - use oxygen in respiration
  - water animals cannot respire
  - pathogens in water

(fertiliser)
- algae multiply
  - (algae) block light so plants cannot photosynthesise
  - lack of oxygen for respiration – fish die

(toxic substances)
- damages / harms cells **or** bioaccumulation
  - interferes with metabolism − e.g. respiration / protein synthesis

- (plastics)
- entrap animals or causing internal damage if swallowed

(particles)
- block light
  - plants / algae cannot photosynthesise so less glucose made

(oil)
- damages birds' feathers
  - cannot fly so cannot find food **or** escape predators

(acid rain / acids)
- lowers pH of water
  - damages fish gills
  - bleaches coral

[10]