

Past-paper walk-through

Pollution ■ 20.3

eXercise

Questions in this set

- 0610/21 N25 Q37 ■ 1 mark
- 0610/22 N25 Q39 ■ 1 mark
- 0610/23 N25 Q39 ■ 1 mark
- 0610/21 J25 Q39 ■ 1 mark
- 0610/22 M25 Q39 ■ 1 mark
- 0610/42 M25 Q6 ■ 14 marks

Reading the mark scheme

- **B1** a mark that stands on its own – the point is either made or not.
- **M1** a *method* mark: the right approach, even if the number is wrong.
- **A1** an *answer* mark, and it usually needs its M mark first.
- **C1** a working mark on the way to the answer.
- **//** separates answers the examiner accepts equally.
- **ecf** = error carried forward: a later part is marked on your own earlier answer.
- **owtte** = “or words to that effect” – the wording need not match.

Question 37

0610/21 N25 ■ Q37 ■ 1 mark

37 Eutrophication results in a reduction in the dissolved oxygen in streams and lakes.

What causes the reduction in dissolved oxygen?

- A** decreased aerobic respiration by decomposers
- B** decreased aerobic respiration by fish
- C** increased aerobic respiration by decomposers
- D** increased aerobic respiration by fish

Solution 37

Answer: **C**

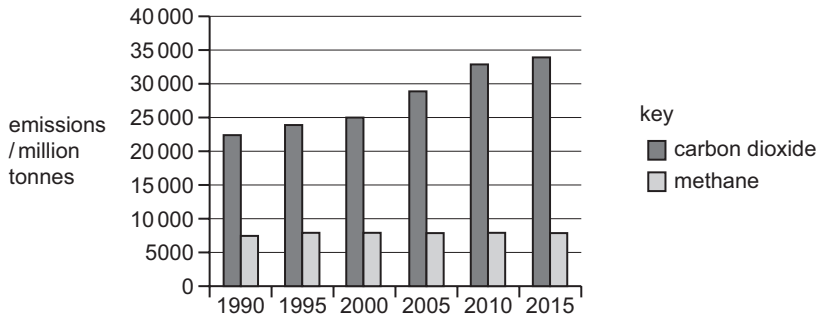
Why

- Extra nutrients make algae bloom, and the algae then die in large numbers.
- Decomposer bacteria multiply on the dead algae and respire aerobically.
- It is that *increased* aerobic respiration by decomposers that strips the oxygen from the water.

Question 39

0610/22 N25 ■ Q39 ■ 1 mark

39 The graph shows the global emissions of carbon dioxide and methane from 1990 to 2015.



Question 39

year

A student makes four statements about carbon dioxide and methane.

- Carbon dioxide and methane were the only sources of greenhouse gases produced in 1990.
- Carbon dioxide emissions continue to rise to the present day.
- Carbon dioxide has a greater effect on climate change than methane.
- Methane emissions were lower than carbon dioxide emissions between 1990 and 2015.

How many statements are supported by these data?

A 1

B 2

C 3

D 4

Solution 39

Answer: **A**

Why

- Read the two lines separately and compare their scales before drawing any conclusion.
- Carbon dioxide is emitted in far greater quantity than methane.
- But both have risen over the period, which is what drives the greenhouse effect.

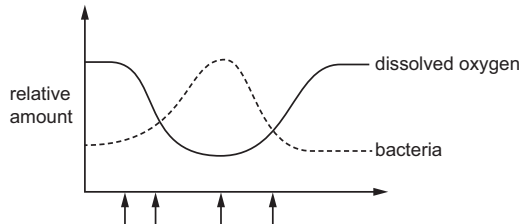
Question 39

0610/23 N25 ■ Q39 ■ 1 mark

- 39** The graph shows the relative amounts of bacteria and dissolved oxygen at different locations along a river.

Fertiliser has entered the river.

At which distance along the river did the fertiliser enter the river?



Question 39

A B C D

distance along the river

Solution 39

Answer: **A**

Why

- The fertiliser causes algae to bloom and then die, so decomposer bacteria multiply.
- Those bacteria respire aerobically, using up the dissolved oxygen.
- So the oxygen is lowest where the bacterial count is highest, a little downstream of the input.

Question 39

0610/21 J25 ■ Q39 ■ 1 mark

39 Which source of pollution can cause eutrophication?

- A** carbon dioxide
- B** methane
- C** non-biodegradable plastic
- D** sewage

Solution 39

Answer: **D**

Why

- Eutrophication is caused by an excess of nitrate or phosphate entering the water.
- Sewage is rich in both, as are fertiliser run-offs.
- Carbon dioxide and methane are greenhouse gases and plastic is a physical pollutant, not a nutrient.

Question 39

0610/22 M25 ■ Q39 ■ 1 mark

39 How does eutrophication lead to the death of fish?

- A** A sudden increase in the number of bacteria increases the spread of disease.
- B** Algae respire instead of photosynthesise.
- C** Decomposer bacteria lower the oxygen concentration in the water.
- D** Fertilisers reduce the availability of nitrates in the water.

Solution 39

Answer: **C**

Why

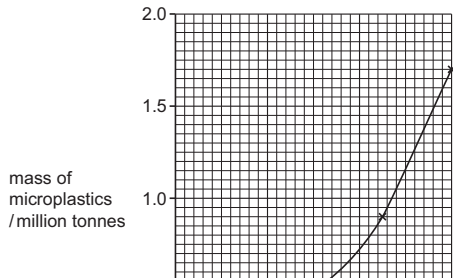
- Extra nitrate makes algae grow rapidly, then die in large numbers.
- Decomposer bacteria feeding on the dead algae multiply and respire aerobically.
- They use up the dissolved oxygen, so the fish suffocate.

Question 6

0610/42 M25 ■ Q6 ■ 14 marks

- 6 (a) Microplastics are pieces of plastic with a diameter less than 0.5 cm.

Fig. 6.1 shows the mass of microplastics in the oceans between 2000 and 2040. The data between 2000 and 2020 is an estimate. The data after 2020 is a prediction.



Question 6

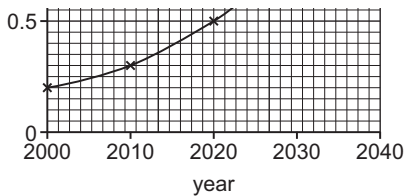


Fig. 6.1

- (i) Suggest why the mass of microplastics between 2000 and 2020, shown in Fig. 6.1, is an estimate.

Question 6

- (ii) Using Fig. 6.1, calculate the predicted percentage increase in the mass of microplastics in the oceans between 2000 and 2040.

Space for working.

Question 6

[2]

- (b)** Phytoplankton are producers found in the ocean. Phytoplankton absorb microplastics into their cells.
- (i)** Describe what is meant by the term producer.

Question 6

(ii) Fig. 6.2 shows a shearwater bird.

Shearwater birds feed on fish in the ocean.



Question 6



Question 6



Fig. 6.2

Suggest how microplastics can end up in consumers such as shearwater birds.

Question 6

(iii) The population of shearwater birds is decreasing.

Describe **three** ways the population of shearwater birds can be conserved.

Question 6

Question 6

Question 6

Question 6

Question 6

Question 6

[3]

- (iv) Explain the risks to a population if its population size decreases.

Question 6

[Total: 14]

Solution 6

(a)(i)

Mark scheme

- any two from:
- idea that not all microplastics are able to be, collected / measured / weighed ;
- because the area is, (too) large / inaccessible / deep / undiscovered ;
- because some microplastics were eaten ;
- only samples were taken / described ;
- 2

Solution 6

(a)(ii) Mark scheme

- 750 (%) ;;
- 2 MP1: both figures identified from graph e.g.
- 1.7 and 0.2 (million tonnes) or
- difference found e.g. 1.5 (million
- tonnes)
- MP2: correct calculation e.g. $1.5 \div 0.2 \times 100$
- = 750

Solution 6

(b)(i)

Mark scheme

- (organism) makes its own (named organic) nutrients ;
- using energy from sunlight / through photosynthesis ;
- 2
- 0610/42
- February/March 2025
- Guidance

Solution 6

(b)(ii)

Mark scheme

- any two from:
- microplastics, can't breakdown / are non-biodegradable / can't be excreted ;
- (microplastic-containing) producers / phytoplankton, are eaten by fish (which
- are eaten by birds) ;
- AVP ;
- 2

Solution 6

(b)(iii) Mark scheme

- any three from:
- monitoring species ;
- idea of protecting, habitat / nest sites ;
- education / awareness ;
- captive breeding programmes ;
- ban, hunting / poaching ;
- 3

Solution 6

(b)(iv) Mark scheme

- any three from:
- 1 reduction in genetic variation ;
- 2
- inbreeding ;
- 3
- less chance of population adapting to a (named) change in the
- environment ;
- 4

Solution 6

- increased chance of harmful recessive alleles being
- expressed / increase in genetic disease ;
- 5
- extinction ;
- 6
- idea that more difficult to find a mate ;
- 7
- AVP ;
- 3