

Organisms and their environment practice questions

11 questions • 30 marks • mark scheme at the back

For Cambridge IGCSE Combined Science 0653. **Supplement** is Extended content, only examined on Papers 2 and 4.

Name

Total / 30

Energy flow, food chains and food webs Spec B15.1, B15.2

- 1** What is the principal source of energy input to biological systems? [1 mark]
- A. ☐ Chemical energy in glucose
- B. ☐ Heat from the soil
- C. ☐ Light energy from the Sun
- D. ☐ Energy released by decomposers
- 2** In a food chain, what do the arrows show? [1 mark]
- A. ☐ The direction in which animals move
- B. ☐ The transfer of energy from one organism to the next
- C. ☐ The number of organisms at each level
- D. ☐ The organisms that are harmful to others
- 3** Describe the flow of energy through living organisms, starting with light energy from the Sun. [3 marks]

- 4** A food chain is: lettuce → snail → thrush → sparrowhawk (a) State the producer in this food chain. [1] (b) State the organism that is the secondary consumer. [1] (c) Name the organism that gets its energy directly from the thrush. [1] (d) State what the arrow between the lettuce and the snail represents. [1] **[4 marks]**

- 5** The table shows what each organism in a woodland food web eats. (a) State the number of different organisms that eat caterpillars. [1] (b) Name one organism that is both a primary consumer and a secondary consumer. [1] (c) Define the term food web. [1] (d) Suggest what happens to the number of owls if all the blue tits are killed by disease. [1] **[4 marks]**

Feeding relationships in a woodland food web	
Organism	Eats
Oak leaves	(producer)
Caterpillar	Oak leaves
Mouse	Oak leaves, caterpillar
Blue tit	Caterpillar
Owl	Mouse, blue tit

- 6** Which organism gets its energy from dead or waste organic material? **[1 mark]**

- A. ☐ A producer
B. ☐ A herbivore
C. ☐ A decomposer
D. ☐ A secondary consumer

7

Supplement

[5 marks]

Fishing boats catch large numbers of a fish that is eaten by seals and that eats small crustaceans. (a) State the term for catching a species faster than it can replace itself. [1] (b) Describe the effect of this on the seal population and explain your answer. [2] (c) Describe two ways in which introducing a foreign species to a habitat can affect the food web. [2]

Nutrient cycles

Spec B15.3

8

Which process removes carbon dioxide from the air?

[1 mark]

- A. ☐ Respiration
- B. ☐ Combustion
- C. ☐ Photosynthesis
- D. ☐ Decomposition

9

Describe how carbon in the bodies of dead plants returns to the air as carbon dioxide, and how carbon in dead organisms that are buried for millions of years may later return to the air.

[4 marks]

10

A student states that the amount of carbon dioxide in the air stays roughly constant in a natural ecosystem. (a) Name the process that removes carbon dioxide from the air. [1] (b) Name two processes that add carbon dioxide to the air. [2]

[3 marks]

Populations Spec B16.1

11 A woodland contains oak trees, foxes, rabbits, fungi and soil, light and water. (a) State what is meant by the term community. [1] (b) State what is meant by the term ecosystem. [1] (c) Name one population in the woodland. [1] [3 marks]

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Mark scheme

One mark for each point unless a maximum is given. Words in brackets are not needed for the mark.

1. [1]

C C (1)

2. [1]

B B (1)

3. [3]

- light energy is transferred to chemical energy in producers / plants by photosynthesis (1)
- chemical energy passes to consumers / along the food chain when organisms feed (1)
- energy is eventually transferred to the environment / lost as heat (1) allow lost through respiration

4. [4]

- (a) lettuce (1)
- (b) thrush (1)
- (c) sparrowhawk (1)
- (d) transfer of energy (from the lettuce to the snail) (1) ignore 'the snail eats the lettuce' on its own

5. [4]

- (a) 2 / mouse and blue tit (1)
- (b) mouse (1)
- (c) a network of interconnected food chains (1)
- (d) owls decrease because there is less food (1) allow owls stay about the same because they eat more mice instead; ignore 'owls stay the same' without a reason

6. [1]

C C (1)

7. [5] **Supplement**

- (a) overharvesting / overfishing (1)
- (b) seal population decreases / seals die or move away (1)
- (b) because there is less food (fish) for them to eat (1)
- (c) the foreign species may eat native species so their numbers fall (1)
- (c) the foreign species may compete with native species for food so their numbers fall (1) allow it becomes a new food source so its predators increase

8. [1]

C C (1)

9. [4]

- decomposers / bacteria and fungi break down the dead plants (1)
- decomposers respire (1)
- releasing carbon dioxide (into the air) (1)
- buried organisms form fossil fuels / coal, oil, gas (1)
- burning / combustion of the fossil fuel releases carbon dioxide (1)
- Max 4

10. [3]

- (a) photosynthesis (1)
- (b) any two from: respiration; combustion / burning; decomposition / decay (2)
- ignore breathing

11. [3]

- (a) all of the populations of different species in an ecosystem (1)
- (b) a unit containing the community of organisms and their environment, interacting together (1)
- (c) all the foxes / all the rabbits / all the oak trees (1) reject an answer naming more than one species