

Human influences on ecosystems practice questions

26 questions • 82 marks • mark scheme at the back

For Cambridge IGCSE Biology 0610 (and 0970, which has the same content). **Supplement** is Extended content, only examined on Papers 2 and 4.

Name

Total / 82

Food supply **Spec 20.1**

1 Which chemical is used to reduce competition from weeds? [1 mark]

- A. ☐ Insecticide
- B. ☐ Herbicide
- C. ☐ Fertiliser
- D. ☐ Antibiotic

2 Describe how fertilisers, insecticides and agricultural machinery have each helped to increase food production. [3 marks]

3 Dairy farmers use selective breeding to increase the volume of milk produced by cows. [4 marks]
Describe how a farmer could use selective breeding to produce cows that give more milk.

- 4** A farmer grows only wheat on a very large field every year. (a) State the term for this type of farming. [1] (b) Give one advantage and two disadvantages of this type of farming. [3] **[4 marks]**

- 5** Describe one advantage and two disadvantages of intensive livestock production. **[3 marks]**

- 6** Explain why a farmer growing a monoculture might use insecticides, herbicides and chemical fertilisers, and suggest one problem that these chemicals could cause. **[5 marks]**

Habitat destruction **Spec 20.2**

- 7** Which statement describes biodiversity? **[1 mark]**

- A. ☐ The number of organisms in an area
B. ☐ The number of different species in an area
C. ☐ The number of plants in an area
D. ☐ The number of habitats in the world

- 8** State three reasons why habitats are destroyed by human activity. **[3 marks]**

9 People fishing remove most of the large predatory fish from a lake. Suggest how this could have a negative effect on the lake ecosystem. **[3 marks]**

10 Which is an effect of deforestation? **[1 mark]**

- A . ☐ Less soil is lost
- B . ☐ Less carbon dioxide in the atmosphere
- C . ☐ More flooding
- D . ☐ More biodiversity

11 Large areas of rainforest are cleared to graze cattle. Explain the undesirable effects of this deforestation. **[5 marks]**

12 Explain how pollution of a river can lead to destruction of the habitat of fish. **[2 marks]**

Pollution Spec 20.3

13 Describe the effects of untreated sewage on a river. **[3 marks]**

Conservation Spec 20.4

19 Define the term sustainable resource. [2 marks]

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20 Explain why the tiger is an endangered species. [4 marks]

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21 Describe four ways in which an endangered species can be conserved. [4 marks]

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22 Supplement Explain how fish stocks can be conserved using quotas, closed seasons and mesh size. [4 marks]

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23

Supplement

[3 marks]

Explain how replanting and protected areas help to conserve forests.

24

Supplement

[4 marks]

Describe how artificial insemination (AI) and in vitro fertilisation (IVF) are used in captive breeding programmes.

25

Supplement

[3 marks]

Describe three reasons for conservation programmes.

26

Supplement

[4 marks]

The population of a rare plant species has fallen to a few individuals. Explain the risks to the species of this reduced genetic variation.

Mark scheme

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

1. [1]

B B (1)

2. [3]

- fertilisers provide mineral ions / nitrates so plants grow better / higher yield (1)
- insecticides kill insect pests so less damage to crops / improve quality and yield (1)
- machinery allows larger areas of land to be farmed / improves efficiency (1)

3. [4]

- select cows that produce the most milk (1) allow bulls whose mothers / daughters gave the most milk
- breed them together (1)
- select the offspring that give most milk (1)
- and breed from these; repeat over many generations (1)

4. [4]

- (a) monoculture (1)
- (b) advantage: machinery can be used efficiently / large amount of food produced / lower cost (1)
- disadvantage: pests / disease spread quickly through crop (1)
- disadvantage: low biodiversity / lots of fertiliser needed / pollution by chemicals (1)
- allow any suitable pairs; the two disadvantages must be different

5. [3]

- advantage: more food from a small area of land / lower cost / quick growth (1)
- disadvantage: animal welfare / stress / little space (1)
- disadvantage: disease spreads easily / waste pollutes water / antibiotics overused (1)

6. [5]

- pests spread easily / eat large amounts of one crop (1)
- insecticides kill insects so yield / quality improved (1)
- herbicides kill weeds so less competition for light / water / ions (1)
- same crop removes the same ions from soil each year so fertiliser replaces them (1)
- problem: run-off into rivers causes pollution / eutrophication / harms other organisms (1)

7. [1]

B B (1)

8. [3]

- building houses / more land for housing (1)
- land for crop plants or livestock (1)
- extraction of natural resources / mining / quarrying (1)
- freshwater or marine pollution (1)
- Max 3

9. [3]

- the prey / smaller fish increase in number (1)
- they eat more of the producers / food source (1)
- so food web is altered / other species lose food and numbers fall (1)

10. [1]

C C (1)

11. [5]

- biodiversity reduced as species lose habitat / food (1)
- some species may become extinct (1)
- soil lost / eroded because no roots to hold it (1)
- flooding because less water absorbed by roots / more run-off (1)
- carbon dioxide increases because fewer trees to photosynthesise / trees burnt or decay (1)

12. [2]

- pollutants (e.g. sewage / fertiliser / plastic) make the water unsuitable / poisonous / reduce oxygen (1)
- so fish die or move away / cannot live there (1)

13. [3]

- contains nitrates / ions so algae and plants grow quickly (1)
- contains organic matter so decomposers / bacteria use oxygen (1)
- less oxygen so fish and other animals die (1)
- may contain disease-causing microorganisms / pathogens (1)
- Max 3
- ignore 'pollutes the river' unqualified

14. [5] Supplement

- increased nitrate / ion availability (1)
- producers / algae grow faster (1)
- algal bloom blocks light so plants below die (1)
- increased decomposition (of dead producers) (1)
- increased aerobic respiration by decomposers / bacteria (1)
- dissolved oxygen falls (1)
- fish die as they need dissolved oxygen (1)
- Max 5
- reject algae use up the oxygen

15. [3]

- (a) cannot be broken down by microorganisms / decomposers (1)
- (b) animals swallow plastic, which blocks the gut / they starve (1)
- animals become tangled and drown / cannot move or feed (1)
- plastic breaks into small pieces that enter food chains (1)
- Max 2 for part (b)

16. [2]

- landfill sites fill up as plastic does not rot (1)
- animals eat plastic or become trapped (1)
- builds up in soil / releases harmful chemicals (1)
- Max 2

17. [1]

B B (1)

18. [5]

- carbon dioxide from burning fossil fuels / burning forests (1)
- methane from cattle / rice paddies / landfill (1)
- Earth re-radiates energy as infrared radiation (1)
- gases trap this heat in the atmosphere; more gases means more heat trapped (1)
- average temperature rises, causing climate change (1)
- reject reference to the ozone layer

19. [2]

- a resource that is produced as rapidly as it is removed from the environment (1)
- so that it does not run out (1)

20. [4]

- habitat destruction / forests cleared (1)
- so less food / shelter / breeding sites (1)
- hunting / killed for body parts faster than they reproduce (1)
- any other valid: climate change / pollution / introduced species / overharvesting of prey (1)

21. [4]

- monitoring populations (1)
- protecting species and habitats / reserves (1)
- education (1)
- captive breeding programmes (1)
- seed banks for plants (1)
- Max 4

22. [4] Supplement

- quotas limit the number or mass caught, so fish are not removed faster than they reproduce (1)
- closed seasons: no fishing in breeding season (1)
- so fish can breed / reproduce (1)
- larger mesh size lets young fish escape (1)
- so they grow and breed later (1)
- Max 4

23. [3] Supplement

- replanting replaces trees that were felled (1)
- so forest cover / timber supply is sustained (1)
- protected areas: trees cannot be cut down (1)
- so habitats / species are kept (1)
- Max 3

24. [4] Supplement

- AI: sperm collected from male and placed into female (1)
- allows breeding between animals that are far apart / will not mate (1)
- IVF: egg fertilised by sperm outside body / in a laboratory (1)
- embryo put into female (of same or related species) to develop (1)

25. [3] Supplement

- maintain or increase biodiversity (1)
- reduce extinction (1)
- protect vulnerable ecosystems (1)
- maintain nutrient cycling (1)
- maintain resource provision: food / drugs / fuel / genes (1)
- Max 3

26. [4] Supplement

- fewer alleles / less variation in the population (1)
- if a new disease arrives, few or no individuals may be resistant (1)
- so the whole population could be killed (1)
- if the environment changes, no individuals may be adapted to it (1)
- so the species is less able to survive / may become extinct (1)
- Max 4