Biodiversity

1. To determine the biodiversity of butterflies in a meadow, the number of different species of butterfly were sampled in a meadow on 12 consecutive days. The results are shown below.

Day	1	2	3	4	5	6	7	8	9	10	11	12
Number of species	11	12	14	18	12	12	18	19	18	12	14	20

Which row, **A** to **D**, shows the correct mode, mean and median for these data?

|	**Mode**	**Mean**	**Median**
A	18	15	14
B	12	15	14
C	18	14	15
D	12	14	15

Your answer ☐ **[1]**

2. Which of the options, **A** to **D**, describes the role of CITES?

A   making conservation a part of normal farming practices
B   restricting the trade in individuals of endangered species
C   stopping the movement of endangered species
D   requiring countries to develop strategies for sustainable development

Your answer ☐ **[1]**

3. The graphs below show the density of two different plant species as proximity to the coast changes.
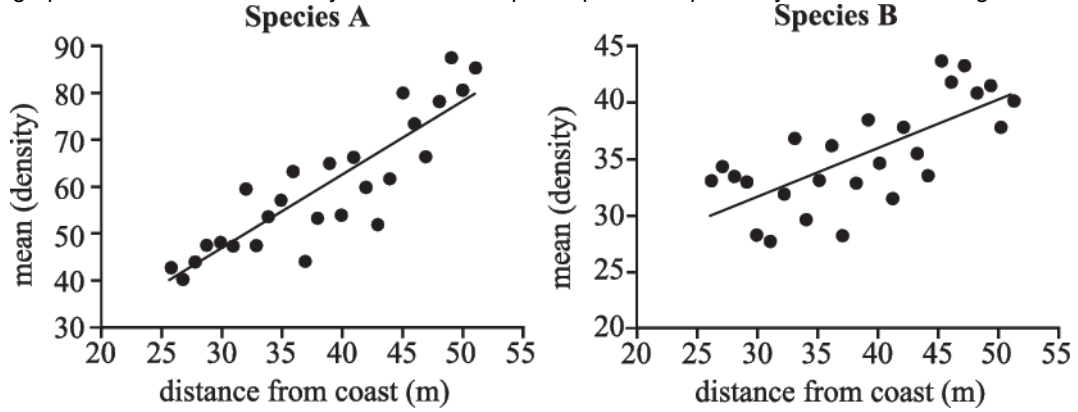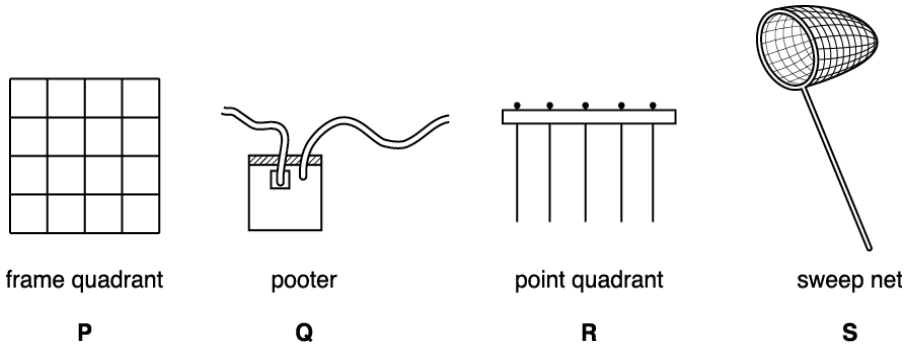

Species A

Species B

Which of the following statements correctly describes one aspect of the technique used to collect these data?

 A. Quadrats were randomly placed using a random number generator and coordinates.
 B. Larger quadrats were required for **species A** because their mean density was higher.
 C. A belt transect has been used to allow calculation of density.
 D. Abiotic factors were measured at every point of quadrat sampling.

Your answer ☐

[1]

4. The images show four pieces of apparatus that could be used to collect data about biodiversity in the field.

| frame quadrant | pooter | point quadrant | sweep net |
| P | Q | R | S |

Which row, **A** to **D**, describes when each piece of apparatus would be used to measure species evenness and richness in a meadow?

Row	Measuring species richness	Measuring species evenness
A	Q, S	R
B	P	P, R
C	P, Q, R, S	P, Q, R, S
D	P, Q, R, S	P, Q, S

Your answer ☐

[1]

5. The following statements describe the benefits of *ex situ* conservation.

    1.   Conditions can be maintained at the optimum.
    2.   Many specimens can be conserved in a small space.
    3.   The health of individuals can be monitored constantly and treatment provided if necessary.

Which of the following, **A** to **D**, identifies the statement(s) that apply to seed banks?

A   1, 2 and 3
B   only 1 and 2
C   only 2 and 3
D   only 1

Your answer ☐

[1]

6. Which of the statements, **A** to **D**, best defines the term *species evenness*?

A   the number of species in an area
B   the relative abundance of each species in an area
C   the relative number of individuals of a species in an area
D   the spread of species over an area

Your answer ☐ **[1]**

7. Turtle doves, *Streptopelia turtur*, were once common in farmland in the UK but their numbers have recently been in decline.

Farmers can claim money from the UK government if they farm in ways that encourage the survival of species such as the turtle dove.

Which of the following agreements is/are relevant to the example described above?
  1   The Convention on International Trade in Endangered Species (CITES)

  2   The Rio Convention on Biological Diversity (CBD)

  3   The Countryside Stewardship Scheme (CSS)

    A   1, 2 and 3
    B   Only 1 and 2
    C   Only 2 and 3
    D   Only 1

Your answer ☐ **[1]**

8. The sea marigold, *Calendula maritima*, is a rare species that is critically endangered and has been included in an *ex situ* conservation project.

Which of the following options, **A** to **D**, is a disadvantage of conserving the sea marigold *ex situ*?

    A   it could reduce genetic diversity in sea marigolds

    B   sea marigolds are collected from the wild as seeds

    C   sea marigold seeds are stored in large numbers

    D   sea marigolds will be at risk from grazing by herbivores

Your answer   **[1]**

9. Which of the following is most likely to increase biodiversity?

    A   captive breeding programmes

    B   climate change

    C   human population growth

    D   monoculture

Your answer   **[1]**

10. A teacher wrote:

"A garden pond is a dynamic environment that is home to a variety of organisms. The temperature of the pond varies depending on the weather and the time of year, and this affects the populations of the species that live there."

Which of the following terms applies to the teacher's description of the garden pond?

A   a community

B   an ecosystem

C   a habitat

D   a niche

Your answer   **[1]**

11. Barnacles are small animals that live on rocky shores.

Adult barnacles are fixed to rocks and do not move about. They catch passing food in the water with modified limbs called cirri when the tide comes in.

Chthalamus stellatus is a species of barnacle found around UK shores.

Two students wished to estimate the population size of *C. stellatus* on a rocky shore near their school.

Which of the following could the students use for estimating the *C. stellatus* population?

1   an abundance scale, such as ACFOR
2   quadrat sampling
3   mark-release-recapture

A   1, 2 and 3
B   only 1 and 2
C   only 2 and 3
D   only 1

Your answer ☐

[1]

12. The image below shows Dawlish Warren, which is a conservation area in the UK.

Which of the following is an aesthetic reason for maintaining biodiversity in Dawlish Warren?

A   maintaining the 200 different animal species
B   maintaining the area as a tourist destination to support local businesses
C   preventing the disappearance of the coastal landscape
D   protecting the sparrowhawk, which is a keystone species

Your answer ☐

[1]

13. A student is investigating species richness of plants along a sand dune from the sea edge moving inland. They are testing the hypothesis that 'species richness increases with distance from the sea'.

Which of the sampling methods, **A** to **D**, would the student use?

A   opportunistic

B   random

C   stratified

D   systematic

Your answer ☐

[1]

14. Biodiversity can be considered at different levels.

An area of woodland habitat has a high Simpson's Index of Diversity.

Which of the following describes an area with a high Simpson's Index of Diversity?

A   the area has a high genetic biodiversity

B   the area has a high habitat biodiversity

C   the area has a high species biodiversity

D   the area is high in all levels of biodiversity

Your answer ☐

[1]

15. Which of the following best defines the term species richness?

A   the distribution of species over an area

B   the number of species in an area

C   the relative abundance of each species in an area

D   the relative number of individuals of a species in an area

Your answer ☐

[1]

16. Moving North from a large solitary tree in the school field, some students studied changes in plant species. They laid a tape measure due North from the base of the tree trunk and dropped a quadrat at 1 m intervals for 15 m.

Which of the following correctly describes the students' sampling method?

A   arbitrary

B   random

C   stratified

D   systematic

Your answer ☐ **[1]**

17. The Millennium Seed Bank has over two billion seeds in storage.

Which of the options, **A** to **D**, describes the type of conservation carried out at the Millennium Seed Bank?

A   in-situ conservation of species biodiversity

B   in-situ conservation of habitat biodiversity

C   ex-situ conservation of species biodiversity

D   ex-situ conservation of habitat biodiversity

Your answer ☐ **[1]**

18. Tropical rainforests have a very high biodiversity of plant species.

Which of the statements, **A to D**, is an economic benefit of high biodiversity?

A   High plant biodiversity decreases the animal biodiversity in the rainforest.

B   High plant biodiversity increases the organic matter in rainforest soils.

C   High plant biodiversity supports drug discovery and development.

D   High plant biodiversity protects the ecosystem from environmental changes.

Your answer ☐ **[1]**

Biodiversity

19. The genetic diversity of a population can be estimated using the following formula:

$$\text{proportion of polymorphic gene loci} \quad = \quad \frac{\text{number of polymorphic gene loci}}{\text{total number of loci}}$$

In 1992 a study estimated the genetic diversity of four isolated populations of lions. They recorded the number of gene variants at a selection of gene loci in each population.

Which of the following populations of lions has the greatest proportion of polymorphic gene loci?

A   Asiatic Lion: 73 polymorphic loci out of 1927.

B   Transvaal Lion: 1110 polymorphic loci out of 2156.

C   Masai Lion: 1030 polymorphic loci out of 2315.

D   West African Lion: 1004 polymorphic loci out of 2008.

Your answer   **[1]**

20. Which of the following **best** describes the term *biodiversity*?

A   the variety of species

B   the number of individuals of each species

C   the variety of genes, species and habitats

D   the variety of genes within a species

Your answer

[1]