Unit 3 Life on Earth Revision Questions

Key Area 6 Evolution of Species

1. Mutations result in changes to genetic material.
   Which of the following is **not** true of mutations?

   A Radiation can increase their rate.
   B They always have a harmful effect.
   C Genetic material is affected at random.
   D New alleles may be produced.

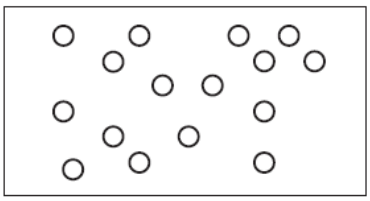
2. Natural selection occurs when there are selection pressures.
   Which of the following could be a result of selection pressures?

   A Organisms with favourable alleles survive and reproduce.
   B Organisms with new alleles always have an advantage.
   C All alleles in a population increase in frequency.
   D All alleles in a population decrease in frequency.

3. Survival of the fittest is also known as

   A selection pressure
   B natural selection
   C selective advantage
   D species selection.

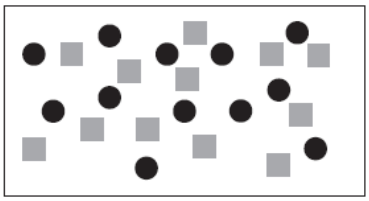
4. The diagram represents a population of animals.



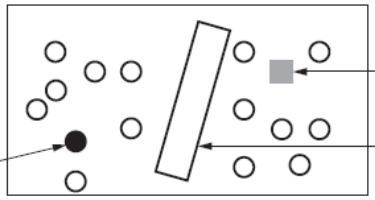
The following diagrams show the stages of speciation occurring from this population.

Stage

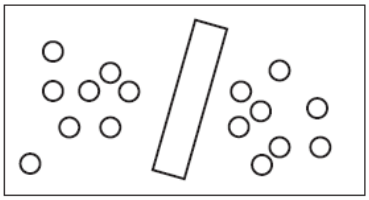
W



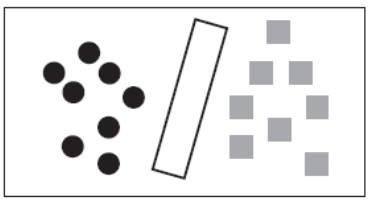
X



Y



Z



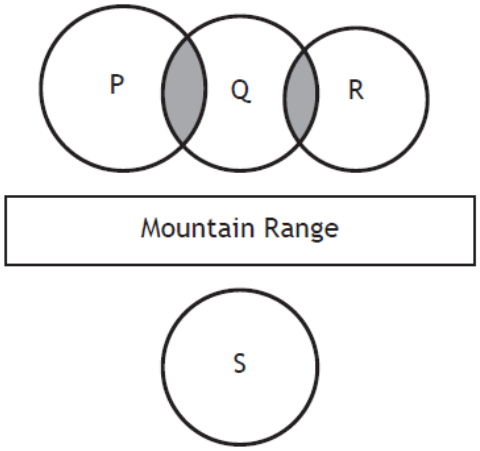
The correct order of the stages of speciation is

A Z, W, X, Y
B Z, X, W, Y
C Y, X, Z, W
D Y, Z, X, W.

5. Which of the following is a source of new alleles in a population?

A Mutation
B Isolation
C Natural selection
D Environmental conditions

6. The diagram below represents four populations of animals P, Q, R and S and areas of interbreeding. Interbreeding takes place in the shaded areas.



How many species may evolve over time?

A 1
B 2
C 3
D 4

7. Antibiotic resistance in bacteria is an example of evolution. Which of the following shows the sequence of events leading to this?

A Natural selection ⟶ mutation ⟶ use of antibiotic
B Mutation ⟶ natural selection ⟶ use of antibiotic
C Mutation ⟶ use of antibiotic ⟶ natural selection
D Natural selection ⟶ use of antibiotic ⟶ mutation

8. The Scottish crossbill is a small bird which is native to Scotland. It inhabits pine forests in northern Scotland and feeds on pine seeds using its crossed beak.

(a) State the term used to describe the role of the Scottish crossbill within its community. 1

_____

(b) The shape of a crossbill's beak is a structural adaptation which is the result of a new allele being produced.

Name the process by which new alleles are produced. 1

_____

(c) The Scottish crossbill has been classified as a separate species, but can still mate with other species of crossbill.

Give a feature of any offspring produced from this mating, which proves that the parents are different species. 1

_____

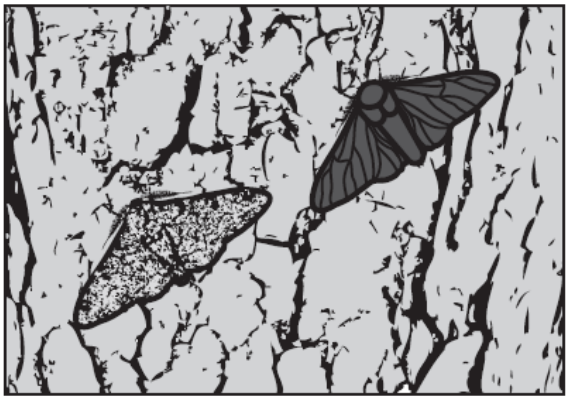
9. Decide if each of the following statements about evolution is **True** or **False** and tick (✓) the appropriate box.

If the statement is **False**, write the correct word in the **Correction** box to replace the word underlined in the statement. **3**

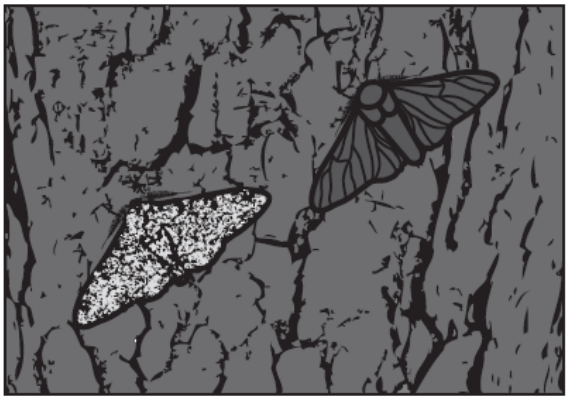
Statement	*True*	*False*	*Correction*
Genetic variation within a population allows the population to <u>adapt</u> in a changing environment.			
Isolation barriers can be geographical, <u>environmental</u> or reproductive.			
Sub-populations evolve until they become genetically <u>identical</u>.			

10. The diagrams below show the light and dark varieties of a moth which can be found in woodland areas. These moths rest on the bark of trees during the day and can be eaten by birds. Normally the bark of trees in the woodland is light coloured. However in industrial areas, pollutants cause the tree bark to darken.

Woodland area



Industrial area



(a) The dark variety of the moth is the result of a random change in the genetic information.

State the term used to describe this change. **1**

_____

(b) An investigation into the population of these moths in a woodland was carried out. The moths were captured, marked and released. 24 hours later the moths were recaptured.

The results are shown in the following table.

Variety of moth	*Number of moths marked and released*	*Number of marked moths recaptured*	*Marked moths recaptured (%)*
Light	480	264	55
Dark	520	208	40

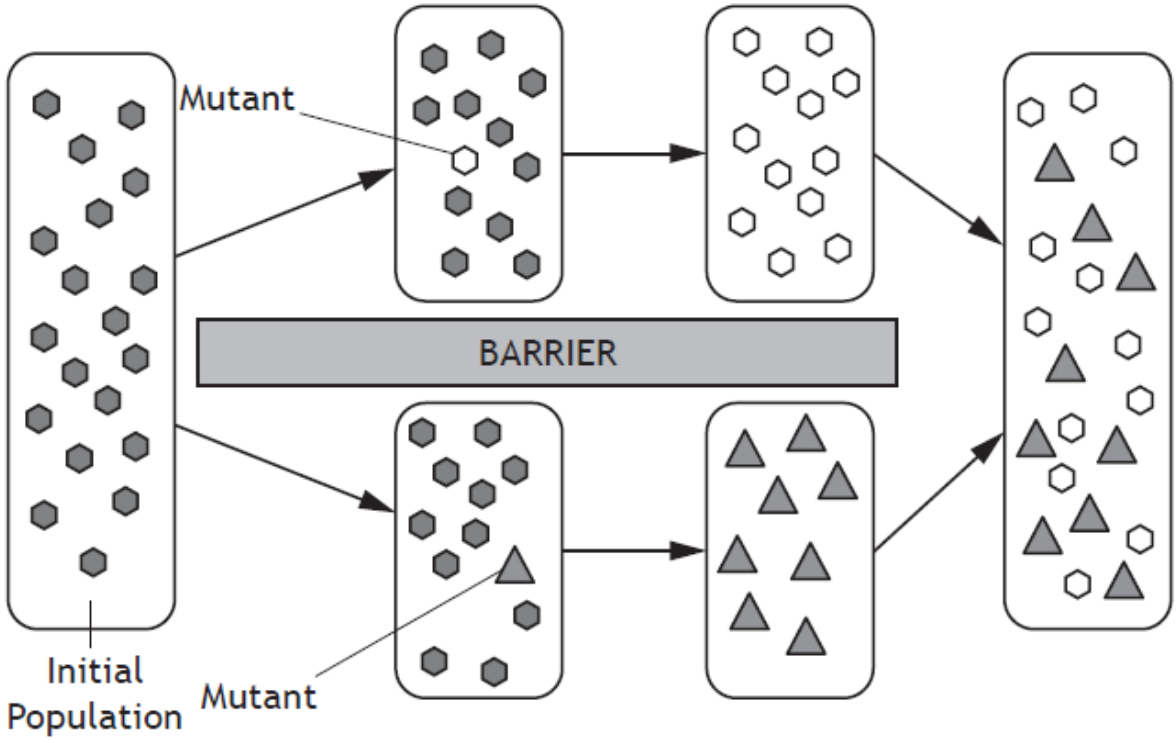
(i) Suggest a reason why the number of the marked moths recaptured was worked out as a percentage. **1**

(ii) The woodland was in a non-industrial area.

Explain why the percentage of light moths recaptured was higher than dark moths. **1**

(iii) Name the process which results in the better adapted variety of moth being more likely to survive and reproduce. **1**

11. The following diagram shows the stages in the formation of a new species.



(a) Using the information in the diagram, describe how new species are formed. 4

(b) Choose either mutation or species and tick (✓) the appropriate box.

Give a definition of the chosen term. 1

Mutation ☐ Species ☐

Definition _____

_____

_____

(c) In any population, variation exists. Explain why variation is important for the survival of a population. 1

_____

_____