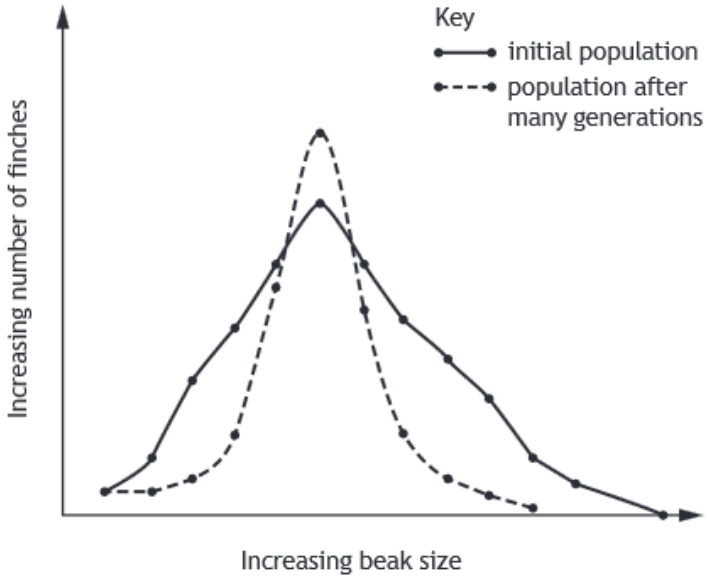
Evolution

B Describe the evolution of new species under the following headings. 9

(i) Isolation and mutation

(ii) Selection

18. A population of finches became isolated on an island. The graph shows the range of beak sizes within the initial population at the time of isolation and in the population after many generations.



Which row in the table shows the type of selection pressure and the type of speciation which might be expected to occur in this example?

	Selection pressure	*Speciation*
A	directional	allopatric
B	directional	sympatric
C	stabilising	allopatric
D	stabilising	sympatric

6. New species have evolved when two populations have become

A isolated by a behavioural barrier

B unable to interbreed to produce fertile offspring

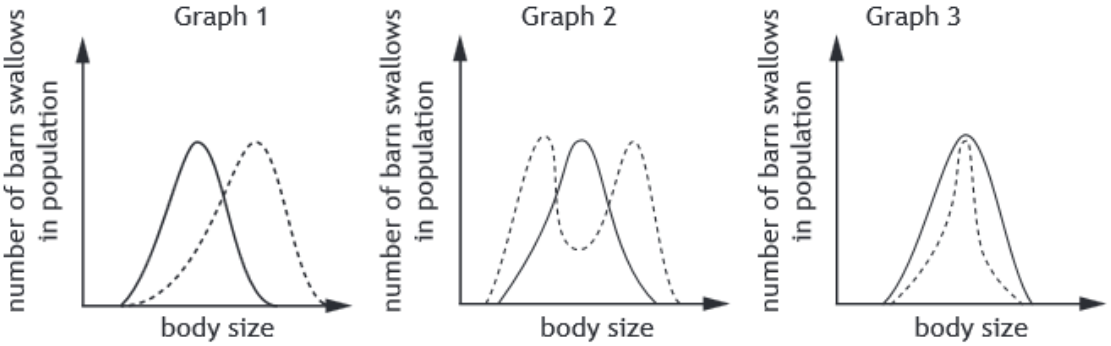
C very different due to directional selection

D very different due to disruptive selection.

4. The graphs below show possible changes in the body size of a population of barn swallows, *Hirudino rusticana*, in response to a selection pressure.

——— original population

····· population after selection



Which row in the table below matches each graph with the type of selection taking place?

	Graph		
	1	*2*	*3*
A	disruptive	directional	stabilising
B	directional	disruptive	stabilising
C	stabilising	disruptive	directional
D	directional	stabilising	disruptive

5. In the North Pacific Ocean there are two different populations of killer whales *Orcinus orca*. One population feeds mainly on fish while the other feeds mainly on sea mammals.

This behavioural barrier has led to considerable genetic variation between these populations.

(a) (i) Name the type of speciation which could occur as a result of this barrier. **1**

(ii) State the importance of isolation barriers in speciation. **1**

(iii) Scientists believe that these two populations are still the same species.

Suggest how they could confirm this. **1**

(ii) Plasmids with these antibiotic resistance genes have been passed to other bacterial species by horizontal transfer.

Describe the process of horizontal transfer. **1**