

19. Organisms and their environment

19.4 Populations

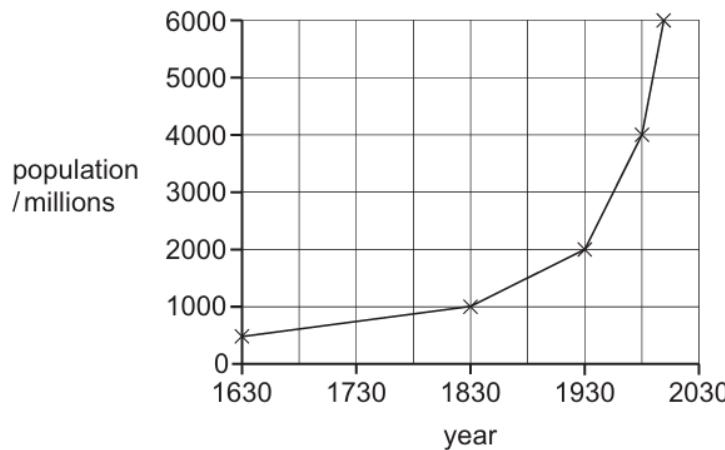
Paper 1 and 2

Question Paper

Paper 1

Questions are applicable for both core and extended candidates

1 The graph shows the increase in the human population of the world since 1630.



What was the longest time taken for the population to double?

A 100 years B 200 years C 300 years D 400 years

2 Which statement describes a population?

A all the three-spined stickleback fish living in a lake
B all the organisms living in a lake
C all the fish living in a lake
D all the three-spined stickleback fish that have ever lived in a lake

3 A herd of red deer live in a forest that contains snakes and a large variety of birds.

Which group of organisms is an example of a population?

A all the animals in the forest
B all the red deer in the forest
C all the organisms in the forest
D all the plants in the forest

4 What is an example of a population?

- A all the arthropods in a pond
- B all the crocodiles in a river
- C all the plants in a wood
- D all the zebras that lived from 1990–2010

5 Which is an example of a population?

- A all the animals and plants living in a lake
- B all the different herbivores in a forest
- C all the mahogany trees growing in a forest
- D all the species of animals in Africa

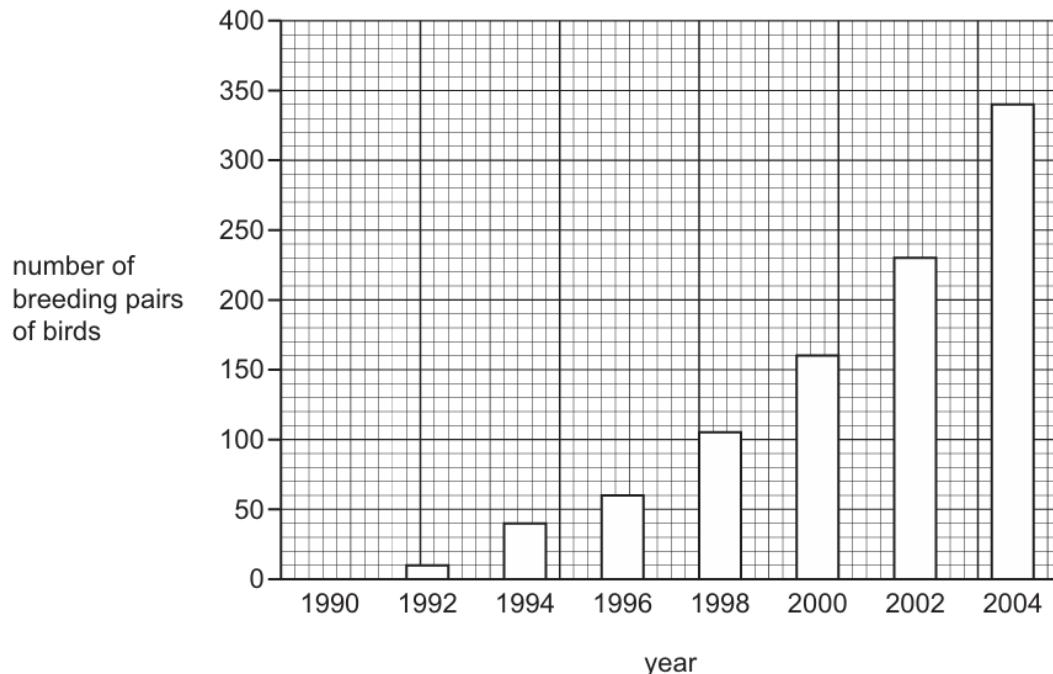
Paper 2

Questions are applicable for both core and extended candidates unless indicated in the question

6 What is a population?

- A a group of different organisms living in different areas at the same time
- B a group of organisms of different species living in the same area
- C a group of organisms of one species living in the same area at different times
- D a group of organisms of one species living in the same area at the same time

7 The graph shows how the population of a species of bird has increased following a conservation programme.

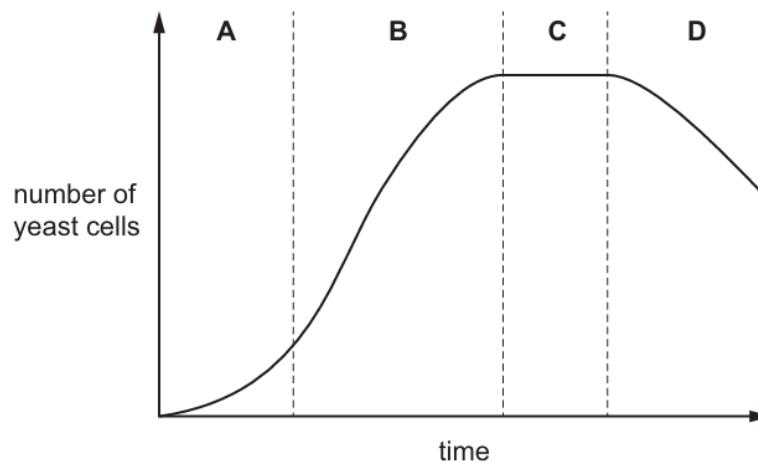


What is the percentage increase in the number of breeding pairs of birds from 1996 to 2002, to the nearest whole number?

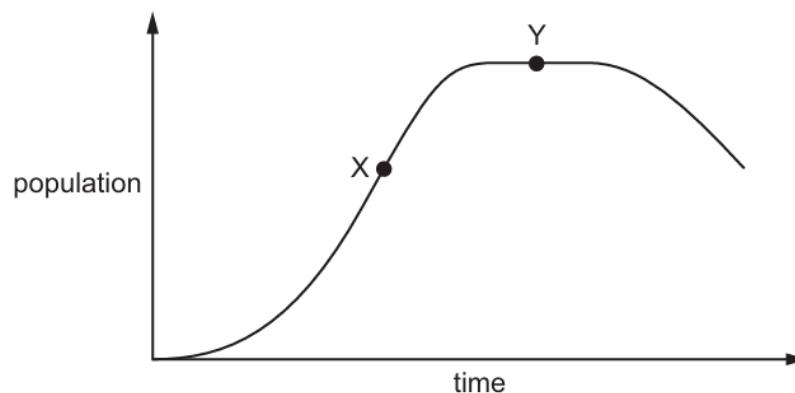
- A 35%
- B 74%
- C 170%
- D 283%

8 The graph shows the population of yeast over a period of time.

Which phase shows when the number of yeast cells dying is equal to the number of new yeast cells being produced?



9 The graph shows the growth of a population of rabbits in one area.



Which statements are correct? **(extended only)**

- 1 At X, the birth rate is higher than the death rate.
- 2 At X, there are no deaths and the population is limited by a lack of food.
- 3 At Y, the birth rate and death rate are equal.

A 1 and 2

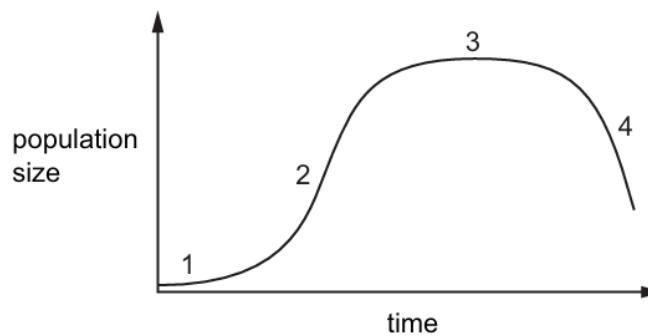
B 1 and 3

C 1 only

D 2 only

10 A few yeast cells were placed in a container of nutrient solution.

The graph shows how their population size changed over time.



Which row shows when the reproduction rate was greater than the death rate for the numbered phases on the graph?

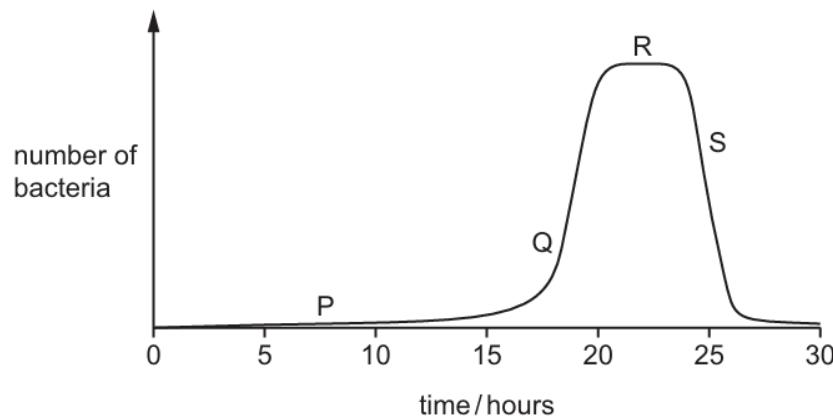
| | reproduction rate greater than death rate | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| A | ✓ | ✓ | ✓ | ✗ |
| B | ✓ | ✓ | ✗ | ✗ |
| C | ✓ | ✗ | ✗ | ✗ |
| D | ✗ | ✓ | ✓ | ✓ |

key

✓ = yes

✗ = no

11 The graph shows the growth curve for a population of bacteria.



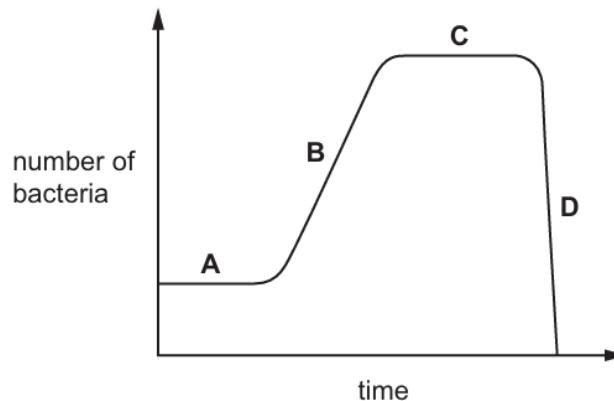
The table identifies each phase shown in the graph.

Which row is correct?

| | death phase | exponential (log) phase | lag phase | stationary phase |
|----------|-------------|-------------------------|-----------|------------------|
| A | P | Q | R | S |
| B | S | Q | P | R |
| C | S | P | Q | R |
| D | P | S | R | Q |

12 The graph shows the growth of a bacterial population.

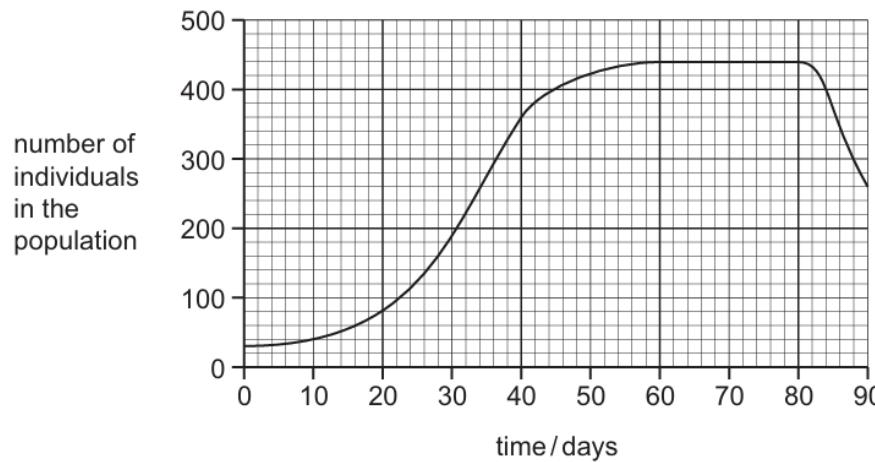
Which section represents the exponential (log) phase?



13 Which term is used to describe the phase of fastest growth in a population of bacteria?

- A** stationary
- B** lag
- C** exponential
- D** sigmoid

14 The diagram shows a population growth curve.



How long does the population remain in the stationary phase?

- A** 8 days
- B** 12 days
- C** 23 days
- D** 48 days

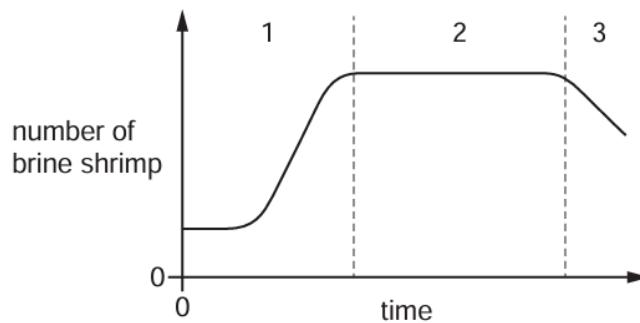
15 What is defined as 'all of the populations of different species in an ecosystem'?

- A** community
- B** environment
- C** habitat
- D** trophic level

16 Which term describes a group of organisms of one species, living in the same area, at the same time?

- A community
- B ecosystem
- C genus
- D population

17 The graph shows the changes in a population of brine shrimp over a period of time.



Over which section or sections is the birth rate greater than the death rate?

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

18 In 1991 there were only fourteen *Daviesia cunderdin* plants.

What happens to a plant population that becomes very small?

- A Each plant will produce fewer offspring.
- B Each plant will produce more offspring.
- C Variation in the population is increased.
- D Variation in the population is reduced.