4. Sickle-cell anaemia is an inherited disease.

Fig. 5.1 is a photomicrograph of some blood cells from a person who has sickle-cell anaemia.

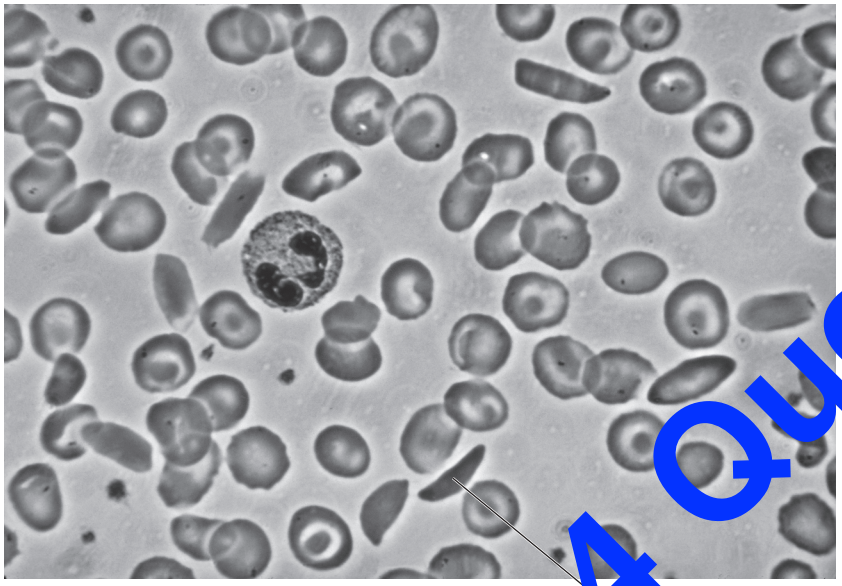


Fig. 5.1

(a) Sickle-cell anaemia is most common in areas of the world where the infectious disease malaria is found.

Some species of the genus Plasmodium cause malaria in humans.

(i) Define the term species.

(ii) The distribution of sickle-cell anaemia is the result of natural selection.

Explain the distribution of the sickle-cell allele in human populations.

(0610_s19_qp_43 - Question 5 (c))

You can also find this question under Inheritance, Variation and selection

4.

(a)

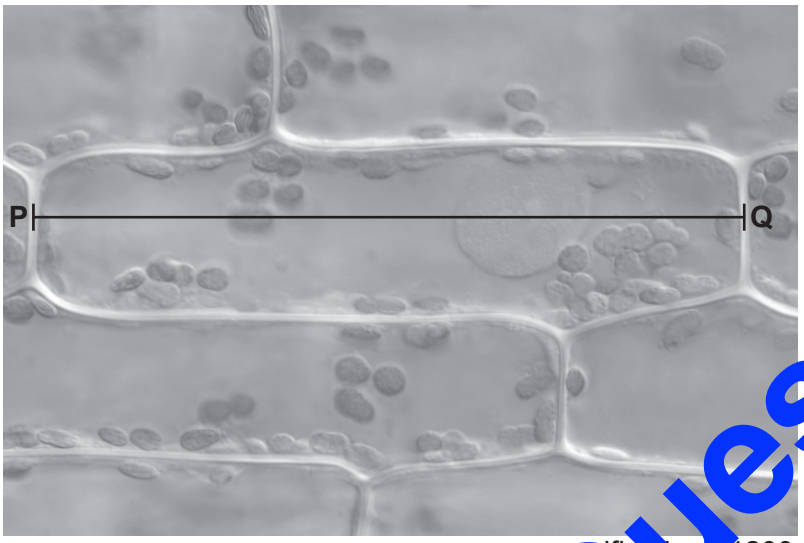
(i) A category of organisms in the naming system that can interbreed to produce viable offspring.

(ii) Persons with sickle cell are immune to malaria. Therefore persons who are heterozygous for genotype have a higher survival rate in regions endemic to the disease. They are therefore more likely to reach maturity and reproduce than others. Due to natural selection, the allele for sickle cells is more likely to be passed down generations until it has a relatively high frequency in the population. This fits the population into the environment hence increasing its fitness and survival.

(*0610_s19_qp_43 - Question 5 (c); Characteristics and classification of living organisms)*

You can also find this question under Inheritance, Variation and selection

(ii)



magnification ×1200

Fig. 2.2

Measure the length of the line PQ on Fig. 2.2.

length of PQ:

Calculate the actual length of the cell using the formula and your measurement.

$$\text{magnification} = \frac{\text{length of line } \mathbf{PQ}}{\text{actual length of cell}}$$

Include the unit.

Space for working.

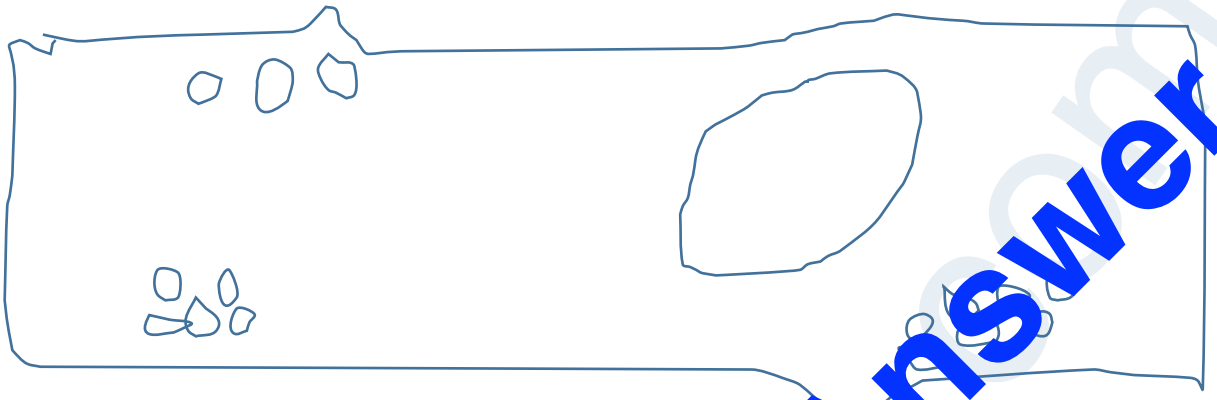
(*0610_w20_qp_62 - Question 2 (a)*)

You can also find this question under Enzymes, Organisms and their environment

2.

(a)

(i)



(ii) length of PQ = 95 mm

1200 = 95/ x

X = 95/1200 = 0.079

Actual length of cell **= 0.08**

(0610_w20_qp_62 Question 2 (a))

You can also find this question under Enzymes, Organisms and their environment