

AS Level Biology B

H022/02 Biology in depth

Question Set 5

1 Blood is made up of different types of cells.

A haemocytometer can be used to determine the concentration of each type of cell in a blood sample.

Fig. 1.1 shows erythrocytes in one section of a haemocytometer chamber.

- The depth of the chamber is 0.1 mm.
- The blood sample was diluted by 1 in 200.

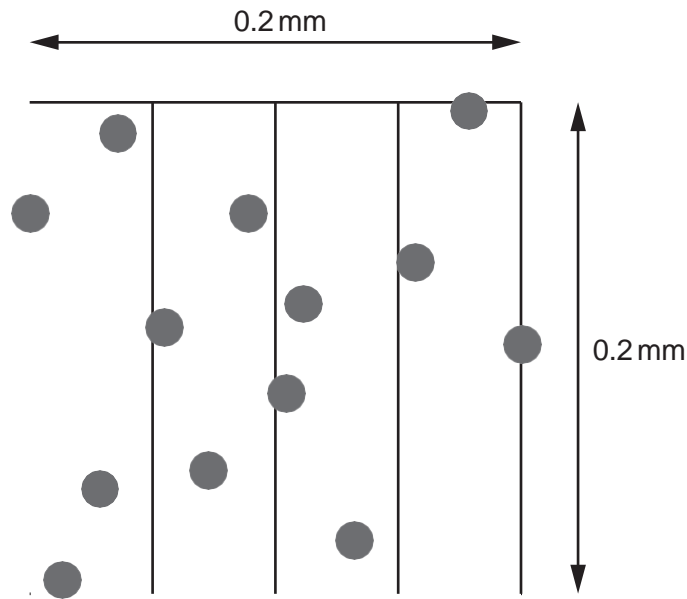


Fig. 1.1

(a) (i) Using Fig. 1.1, calculate the number of cells in 1 mm^3 of undiluted blood.

Answer = [2]

(ii) When preparing blood samples for counting different types of cell using a haemocytometer, technicians follow a set procedure.

For each of the steps below, give **one** reason why it would be included in the procedure.

The haemocytometer slide is cleaned with ethanol.

.....

The blood sample is mixed thoroughly before and after dilution.

.....

A diluting fluid, such as Dacie's fluid, is used.

.....

A stain is added to the diluting fluid.

.....

[4]

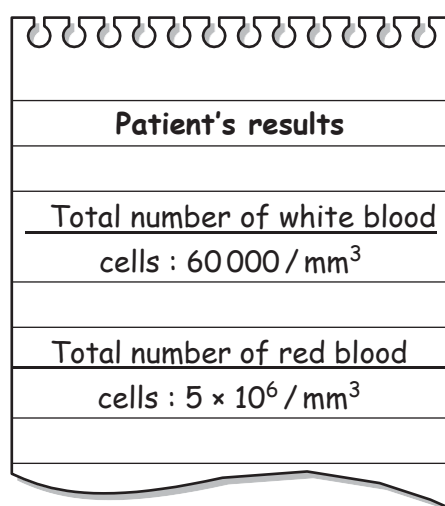
Table 1 shows the standard cell count from a blood sample of a **healthy** person.

Cell type	Number of cells (dm^3)
Erythrocytes	$4.5 \text{ to } 6.5 \times 10^{12}$
Platelets	$1.5 \text{ to } 4.0 \times 10^{11}$
All Leucocytes	$4.0 \text{ to } 11.0 \times 10^9$
Neutrophils	$2.0 \text{ to } 7.5 \times 10^9$
Lymphocytes	$1.0 \text{ to } 4.5 \times 10^9$

Table 1

A haemocytometer was used by a technician to count the blood cells of a patient suspected of having a blood disorder.

Fig. 1.2 shows some of the notes taken by the technician.



The image shows a spiral-bound notebook with the following handwritten notes:

Patient's results
Total number of white blood cells : $60\,000 / \text{mm}^3$
Total number of red blood cells : $5 \times 10^6 / \text{mm}^3$

Fig. 1.2

(b) Using the information in Table 1 and Fig. 1.2, discuss any conclusions the technician could make about the health of this patient and whether a diagnosis could be made.

[4]

Total Marks for Question Set 5: 10

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