

## **A Level Biology B**

**H422/02** Scientific literacy in biology

### **Question Set 7**

1. (a) (i) Fig. 7.1 shows the structures visible in a light micrograph of a generalised animal cell.

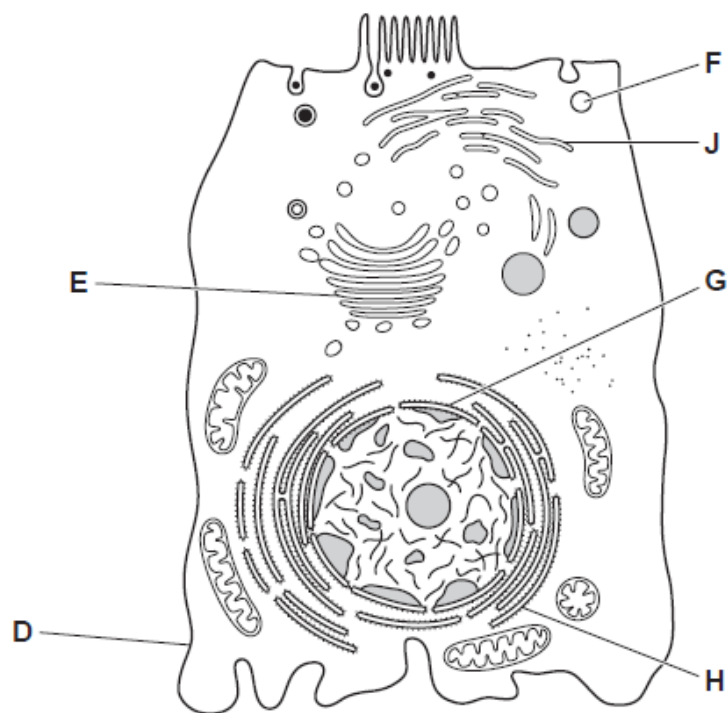


Fig. 7.1

Identify the structures labelled **D** to **H** in Fig. 7.1.

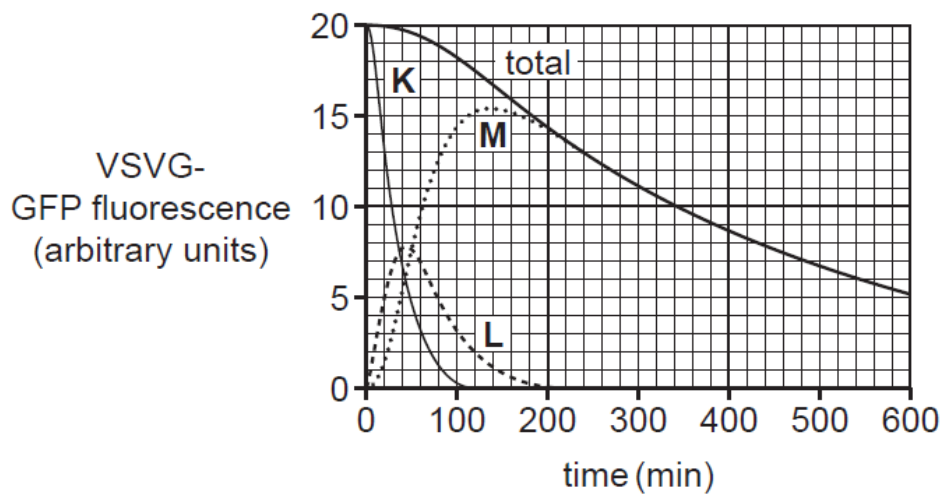
[5]

- (ii) Describe **two** functions of structure **H** and **one** function of structure **J**.

[3]

- (b) (i)** The route taken by proteins that are secreted from the cell has been worked out by many different experiments. One series of experiments involved the following steps:
- A virus was modified so that one of its proteins (VSVG) was tagged with green fluorescent protein (GFP).
  - Cells were infected with the modified virus.
  - The virus produced the tagged protein, VSVG-GFP, using the cells' organelles, but only when the temperature was reduced from 40°C to 32°C.
  - This allowed the path through the cell taken by the VSVG-GFP to be followed by fluorescence microscopy from the time the temperature was reduced.

Fig. 7.2 shows the results of one experiment where the distribution of fluorescence within individual cells was followed for up to 600 minutes.



**Fig. 7.2**

Using Fig. 7.2 and your knowledge of the synthesis and secretion of proteins, identify the organelles corresponding to curves **K**, **L** and **M** on Fig. 7.2.

Give reasons for your answers.

**[6]**

- (c) (ii)** Using Fig. 7.2, estimate the time taken for secretion of VSVG-GFP to reach a maximum.

**[1]**

Vinblastine is a drug used in the treatment of cancer. It inhibits the assembly of microtubules.

Another experiment similar to that described in part **(b)** was carried out, but the cells were treated with vinblastine before the temperature was reduced from 40°C to 32°C.

When VSVG-GFP fluorescence was followed through the treated cells, only curve **M** disappeared.

Suggest why.

**[2]**

**Total Marks for Question Set 7: 17**

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