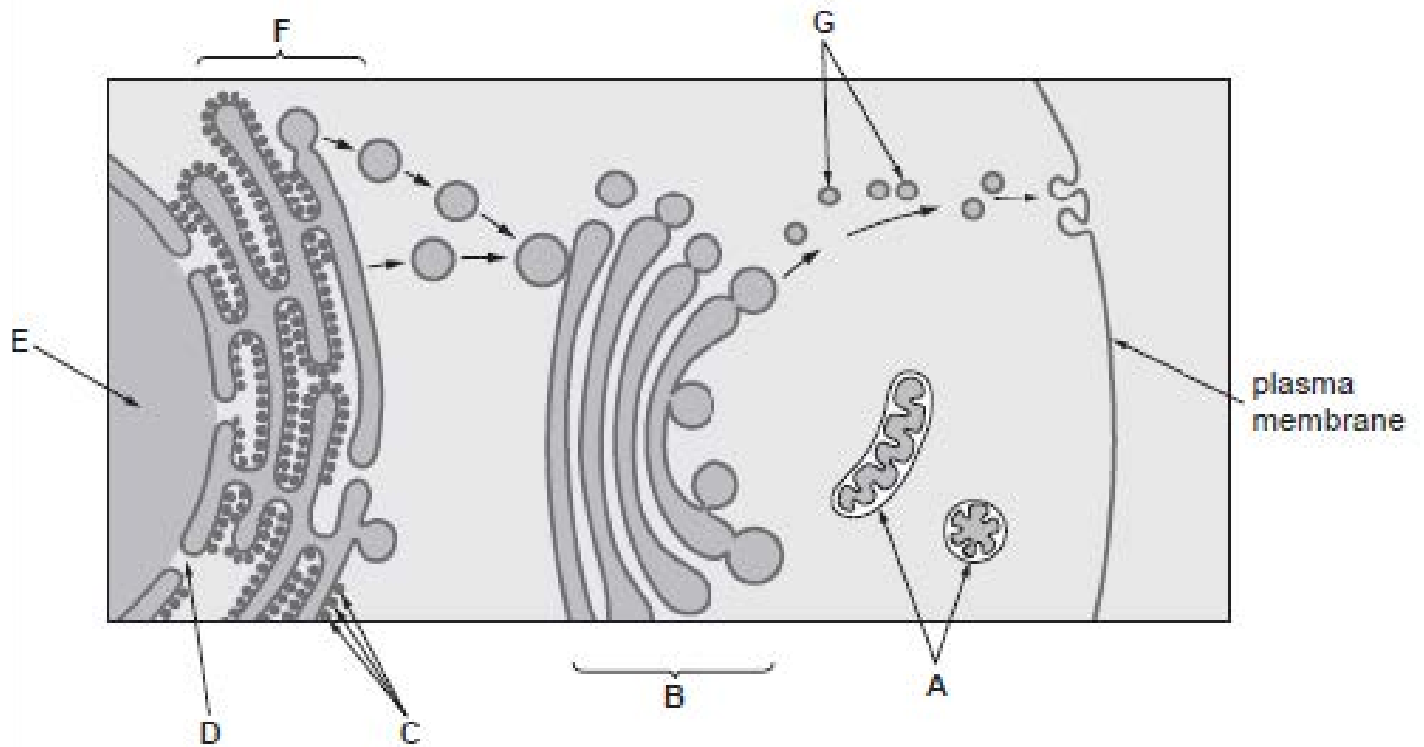


**WJEC (Wales) Biology A-level**  
**Topic 1.2: Cell Structure and**  
**Organisation**  
**Questions by Topic**

1. The diagram below shows part of a cell taken from the pancreas, which is involved in the production of digestive enzymes.



(a) Identify the structures labelled A, B, C, D

[2]

A: .....

B: .....

C: .....

D: .....

- (b) (i) With reference to the structures labelled C, D and E, describe the sequence of events that lead to the production of digestive enzymes in this cell. [3]

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- (ii) With reference to the structures B, F and G, describe the sequence of events that lead to the secretion of digestive enzymes from this cell. [3]

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- (iii) Explain the role of organelle A in the production and secretion of digestive enzymes. [2]

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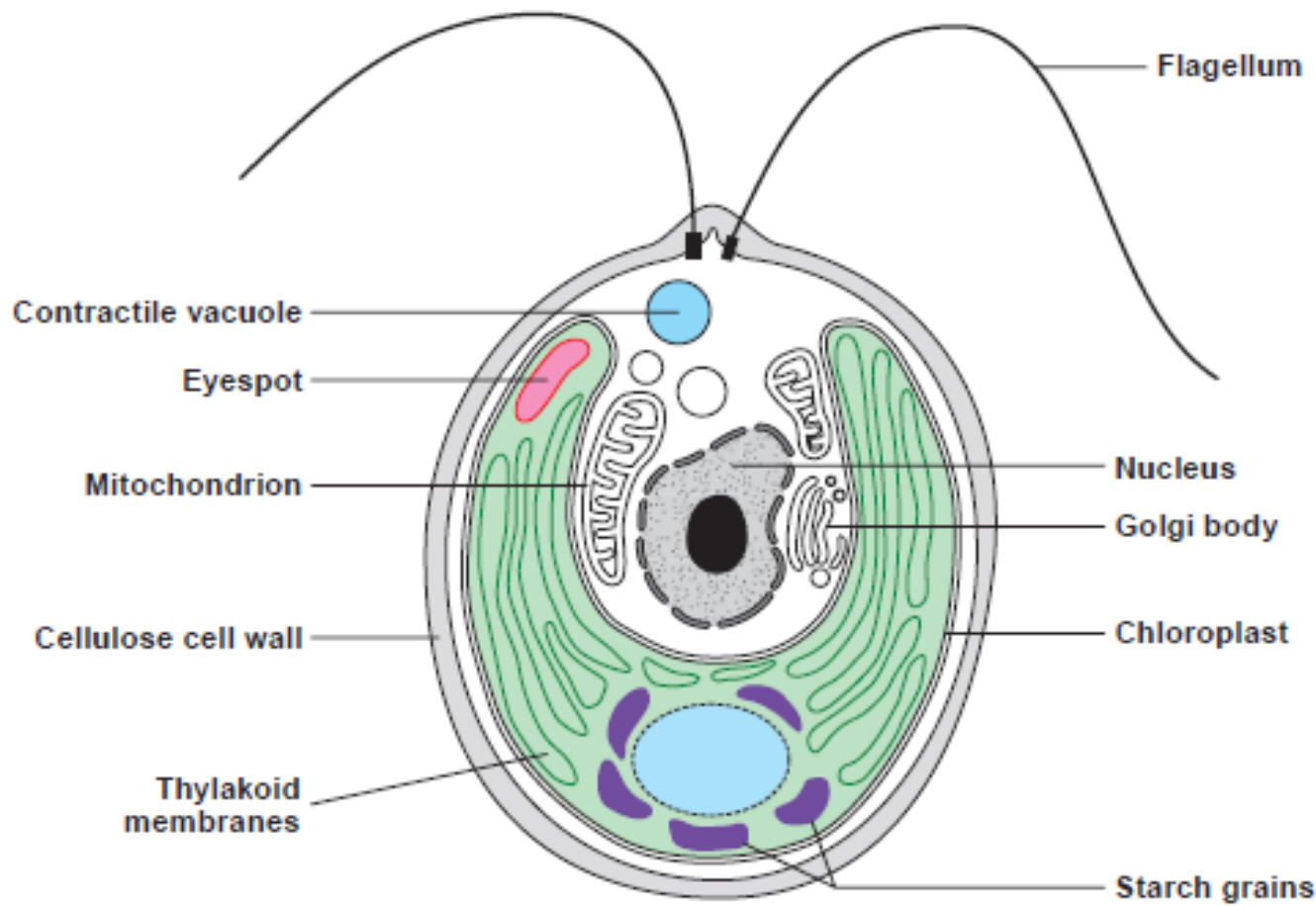
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2.

The classification of protocistan eukaryotes changes frequently. *Chlamydomonas reinhardtii* is now classified as a protocistan but has previously been classified as an animal and a plant. The diagram below shows the structure of this organism.



(a) With reference to the diagram, explain why this organism has, at different times, been classified as an animal and a plant. [2]

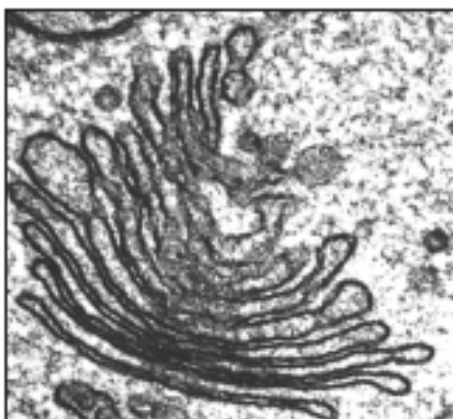
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3. Lysosomal storage disorders are a group of about 50 diseases that are characterised by an accumulation of waste products in the lysosomes. Two examples are Fabry disease and Tay-Sachs disease. Sufferers of Tay-Sachs disease die in childhood.



- (a) The electron micrograph above shows the cell organelle responsible for producing lysosomes. Name the organelle, draw an arrow labelled L on the micrograph to identify a lysosome and describe a general function of lysosomes in normal cells. [3]

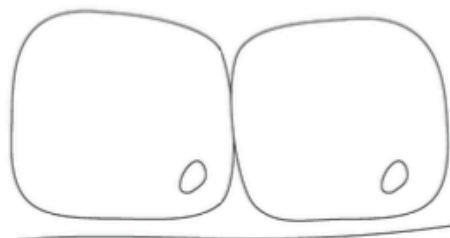
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4. (a) Samples of epithelial tissue were examined using a light microscope. Drawings of cells from these tissues are shown below. Identify the type of epithelial tissue shown, and suggest from where in the body the samples were taken.

(i)

[2]

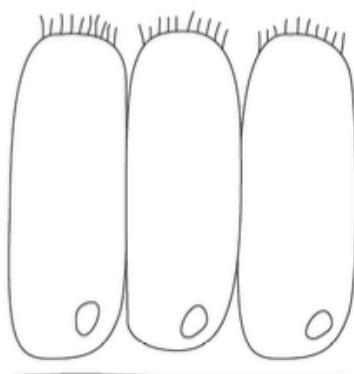


Tissue type .....

Where found in body .....

(ii)

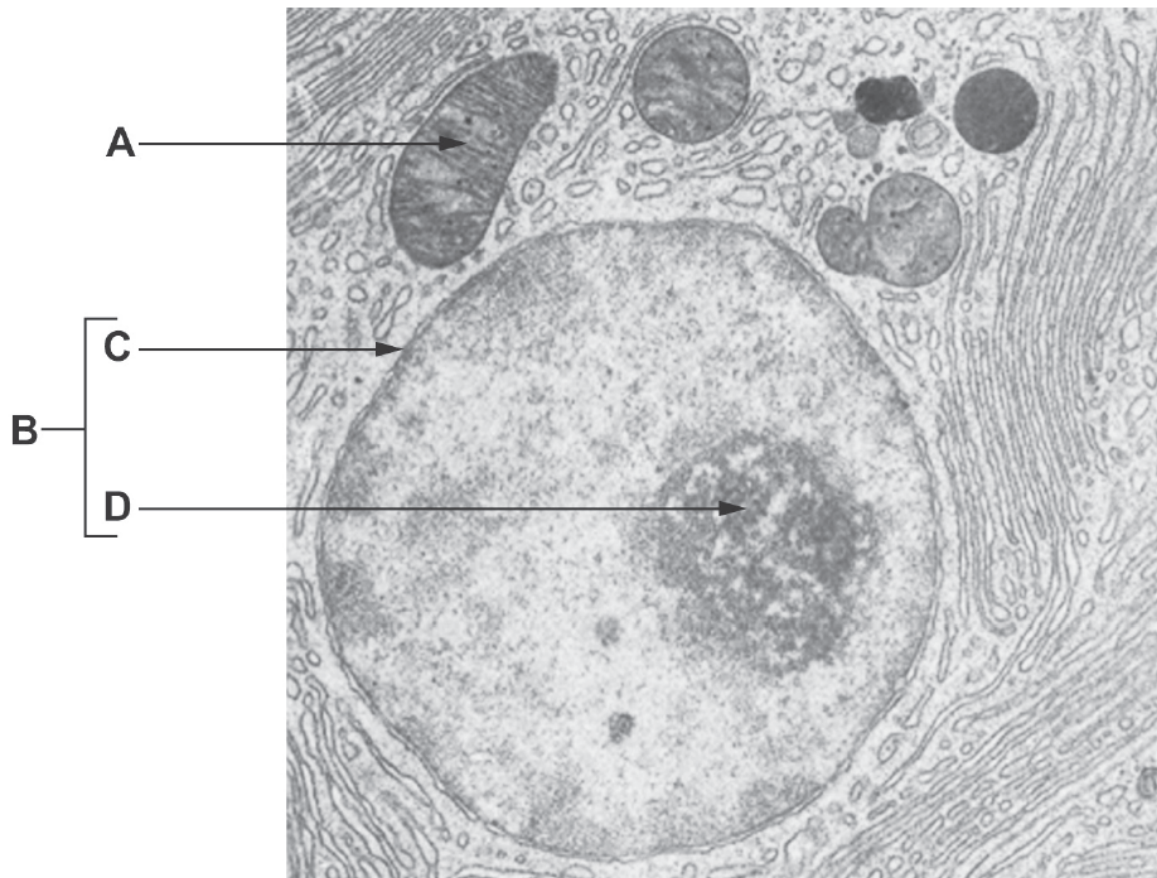
[2]



Tissue type .....

Where found in body .....

The electron micrograph below shows part of a typical animal cell.



(b) Complete the table below by naming the structures and organelles shown in the electron micrograph above, and describing their functions.

[4]

| Letter   | Organelle / Structure | Function |
|----------|-----------------------|----------|
| <b>B</b> | nucleus               |          |
| <b>C</b> | nuclear pores         |          |
| <b>D</b> |                       |          |

(c) The nucleus has pores in the envelope that surrounds it, whereas organelle **A** does not. Describe **one** other difference between the membranes that surround organelle **A** and those that surround the nucleus.

[1]

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(d) Describe **two** differences between the ribosomes found in animal cells and those found in prokaryotic cells.

[2]

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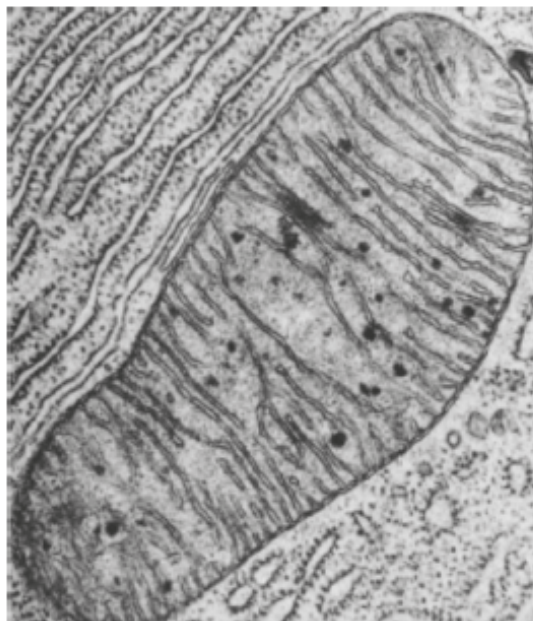
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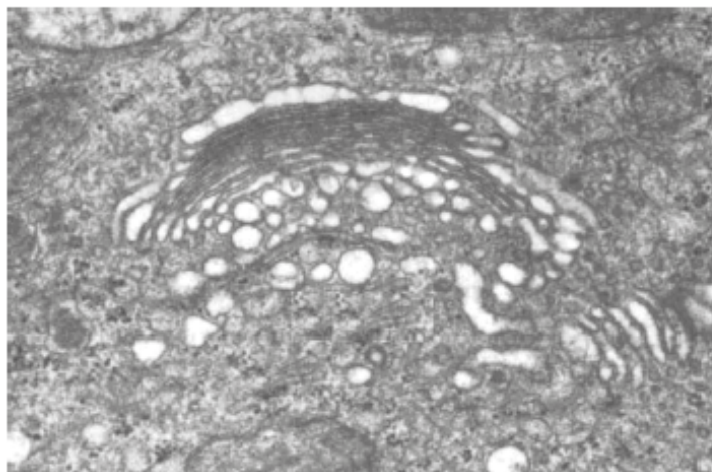
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5. (a) The electron micrographs below show organelles in eukaryote cells.



**A**



**B**

(i) Identify the organelles in photographs **A** and **B** and state their function.

[2]

**A**

.....

Function

.....

.....

**B**

.....

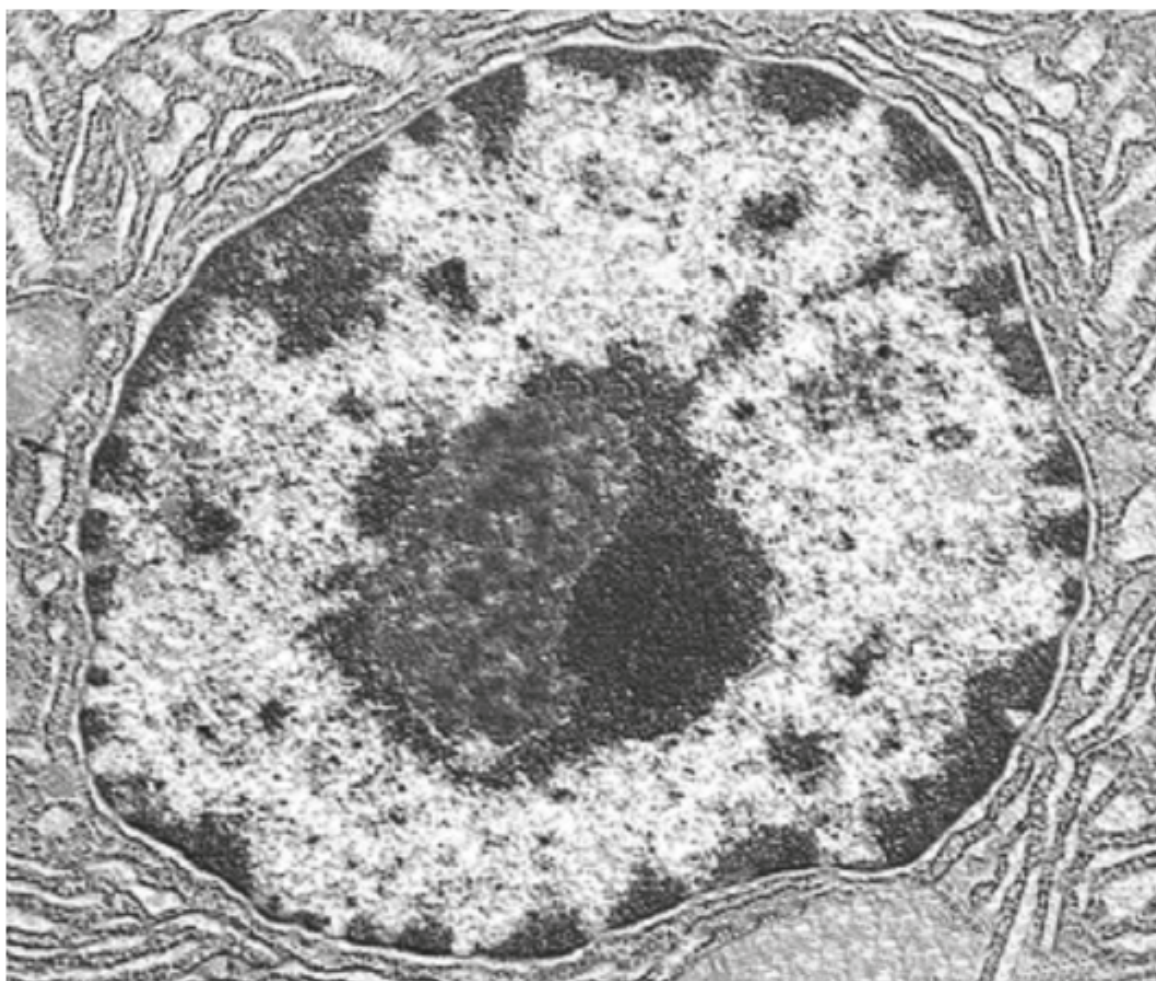
Function

.....

.....

(iii) Name a tissue which contains large numbers of the organelle shown in **A**.

[1]



**C**

(b) Photograph **C** above shows a nucleus. State **two** features of a nucleus that can be seen in this electron micrograph and their function.

[2]

Feature 1

.....

Function

.....

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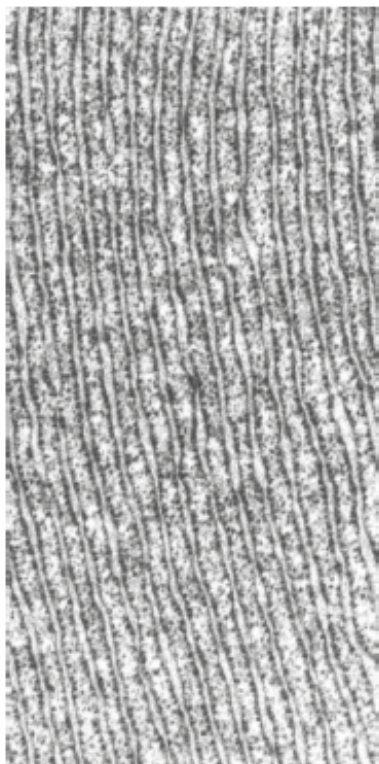
Feature 2

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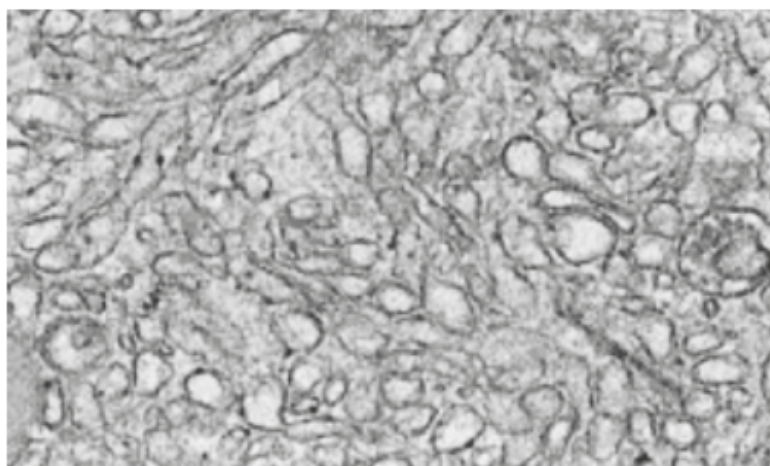
Function

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**D**



**E**

(c) Photographs **D** and **E** above show two different types of endoplasmic reticulum. State **two** visible differences between **D** and **E**.

[2]

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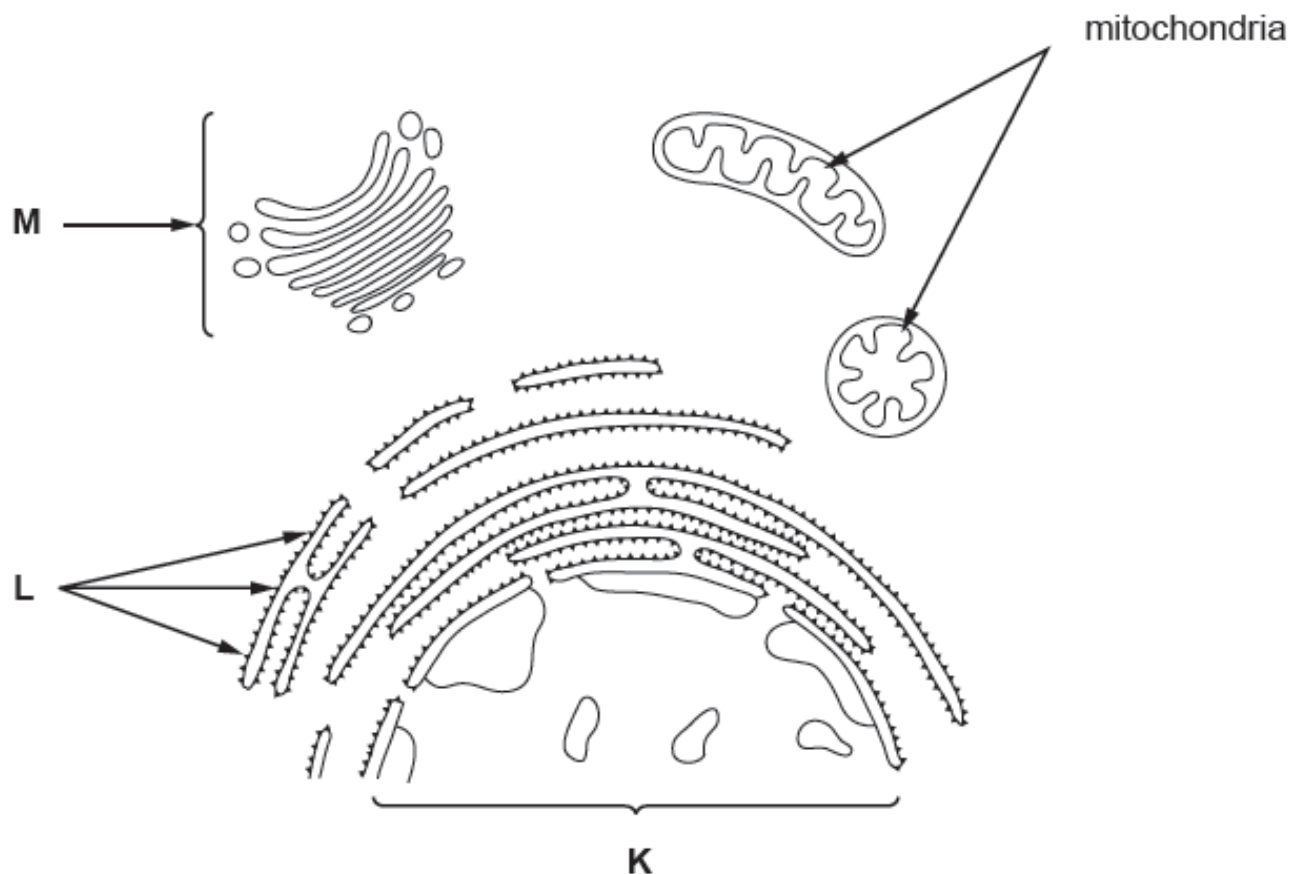
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Total

[7]

6. The diagram below shows part of a generalised animal cell.



(a) Complete the table below.

[6]

| Organelle | Name | Function |
|-----------|------|----------|
| <b>K</b>  |      |          |
| <b>L</b>  |      |          |
| <b>M</b>  |      |          |

(b) (i) Explain why the mitochondria labelled in the diagram above appear different from one another.

[1]

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(ii) Nearly all eukaryotic cells possess mitochondria. Mitochondria are similar in size to prokaryotic cells and have features in common with them. This led to the biologist, Lynn Margulis, proposing that mitochondria evolved from ancient prokaryotes. The theory of endosymbiosis proposes that these ancient prokaryotes were engulfed by other bacterial cells and both benefited from the relationship - this led to the evolution of eukaryotic cells.

Using your knowledge, state which **two** structures found in prokaryotic cells are also found in mitochondria.

[2]

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(iii) Describe **two** differences between mitochondria and prokaryotic cells such as bacteria.

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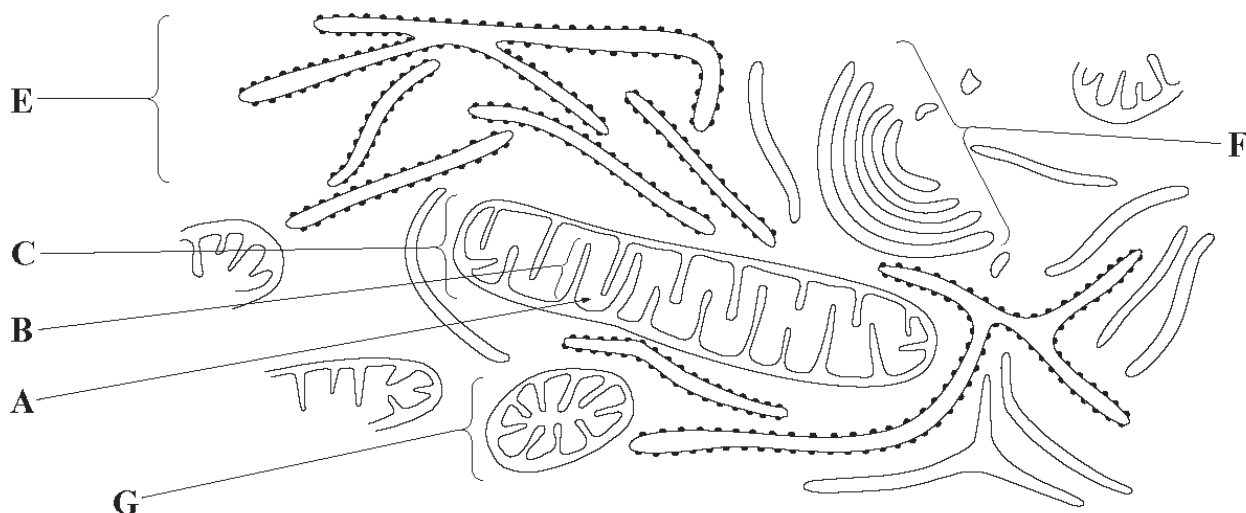
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7. The diagram below shows part of a cell that secretes a hormone into the bloodstream.



- (a) Name structures **A** and **B**. [2]

**A** .....

**B** .....

- (b) Explain the functions of structures **E** and **F**. [4]

**E** .....

.....

**F** .....

.....

- (c) Suggest why this type of cell is likely to contain large numbers of structure **C**. [2]

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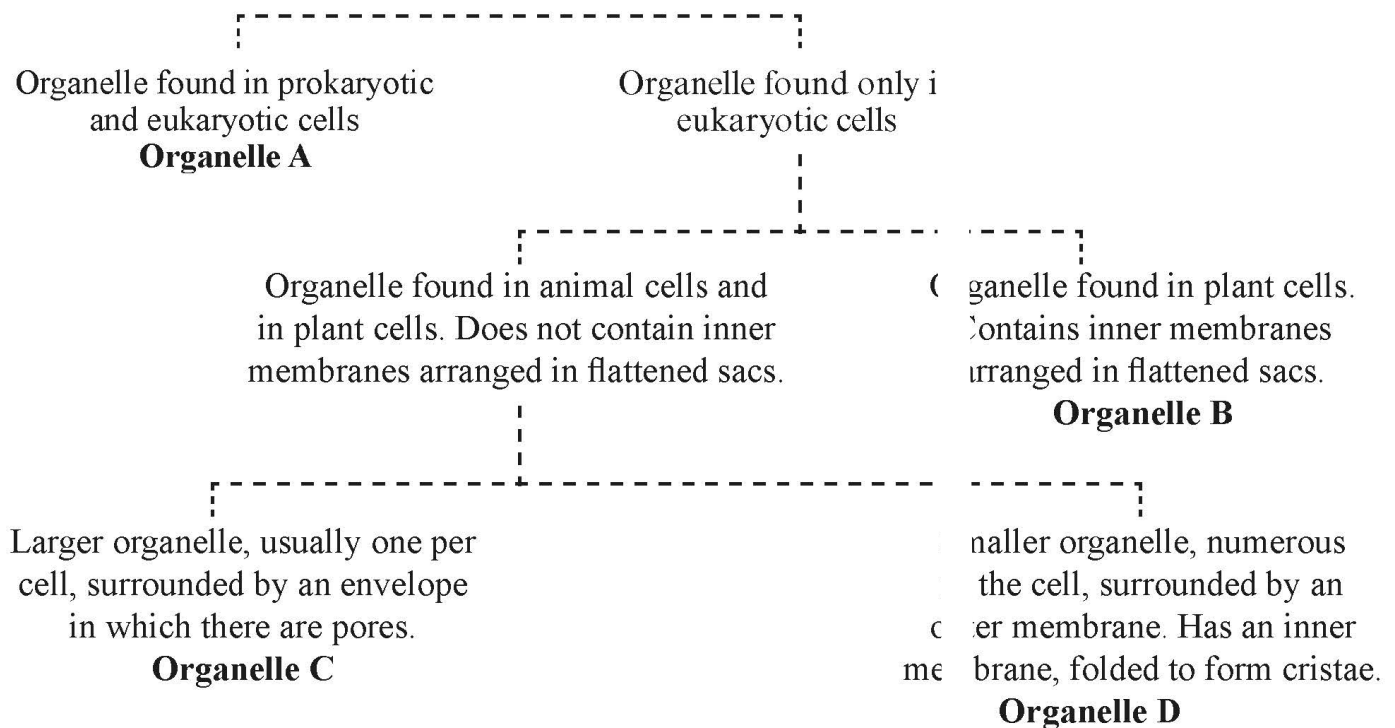
- (d) Labels **C** and **G** show the same type of organelle. Explain why they differ in appearance. [1]

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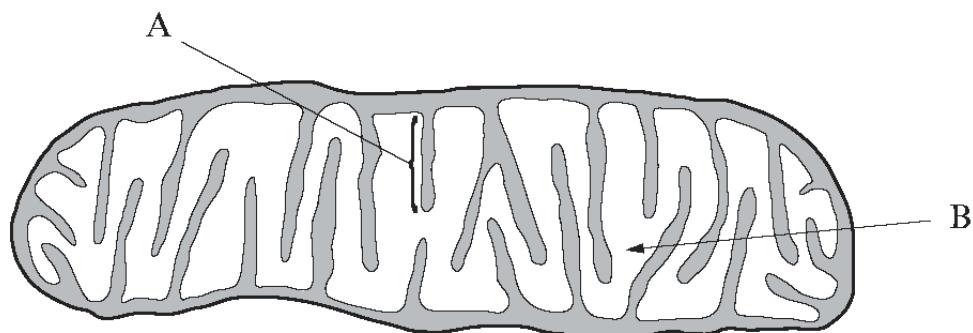
**(Total 9 Marks)**

8. The diagram shows how some organelles may be distinguished from each other.



- (a) (i) Name organelle **D**. [1]
- .....
- (ii) Describe the function of organelle **D**. [2]
- .....
- .....
- .....
- (iii) Name a cell that contains **large** numbers of organelle **D**. [1]
- .....
- (b) Which of the organelles **A**, **B**, **C** or **D** is a ribosome? [1]
- .....
- (c) What is the function of the pores in organelle **C**? [1]
- .....
- .....

9. The diagram below shows an organelle found in a liver cell.



- (a) (i) Name the organelle. [1]

.....

- (ii) State the function of the organelle. [1]

.....

- (iii) Name the structures labelled A and B in the diagram. [2]

A .....

B .....

- (b) Explain why liver cells have large numbers of these organelles present. [2]

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**(Total 6 marks)**