

IB • DP • Biology

🕒 39 mins ❓ 5 questions

Structured Questions: Paper 2

1.2 Cells: Origin & Ultrastructure

1.2.1 Origin of Cells / 1.2.2 Endosymbiotic Theory / 1.2.3 Prokaryotic Cell Structure / 1.2.4 Eukaryotic Cell Structure / 1.2.5 Exocrine Pancreatic & Palisade Mesophyll Cells / 1.2.6 Comparison of Prokaryotic & Eukaryotic Cells / 1.2.7 Microscopes / 1.2.8 Skills: Drawing Cells / 1.2.9 Skills: Cell Origin & Ultrastructure

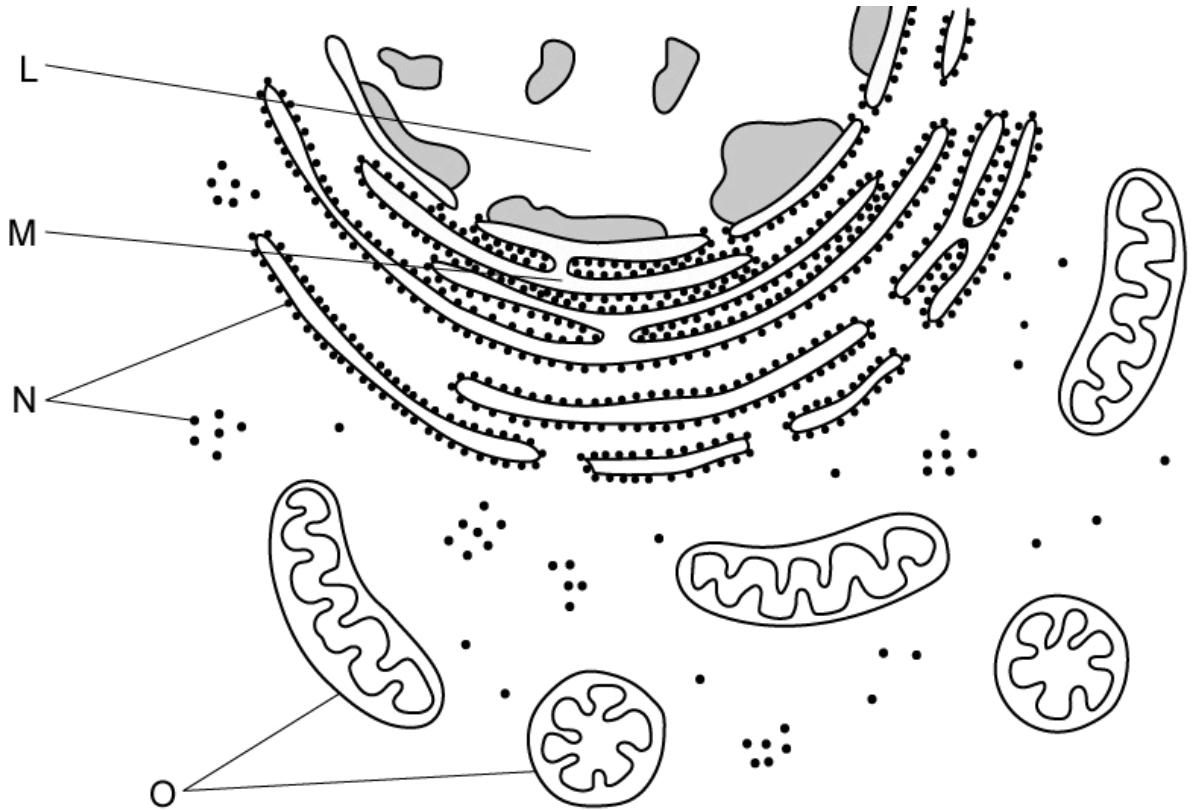
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Total Marks

/39

1 (a) The diagram below shows a magnified view of a cell.



List the names of the structures **L** and **N**.

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(2 marks)

(b) Another structure that would likely be present in the cell seen in part (a) is the golgi apparatus.

State the function of the golgi apparatus.

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(1 mark)

(c) State which type of cell (prokaryotic or eukaryotic) is featured in part (a).

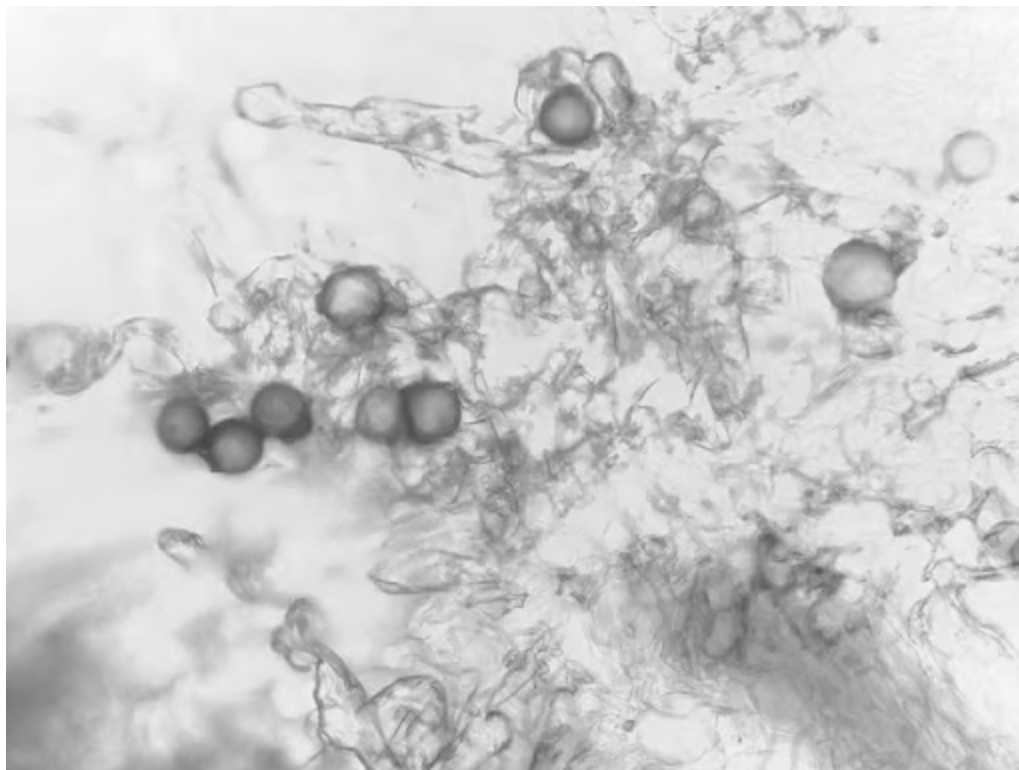
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(1 mark)

(d) Scientists have established a theory that explains the origin of eukaryotic cells.

State the name of this theory.

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(1 mark)

2 (a) The image below is of pollen grains taken under a light microscope.



[Source: By Ergriffi - Edit of File:Pollen grains on the surface of a stigma(Primula vulgaris).jpg,
[https://commons.wikimedia.org/wiki/File:Pollen_grains_on_the_surface_of_a_stigma\(Primula_vulgaris\).jpg](https://commons.wikimedia.org/wiki/File:Pollen_grains_on_the_surface_of_a_stigma(Primula_vulgaris).jpg)]

State which type of microscope would enable scientists to examine the pollen grains in more detail.

(1 mark)

(b) List **two** advantages of the electron microscope.

(2 marks)

(c) List three differences between prokaryotic and eukaryotic cells.

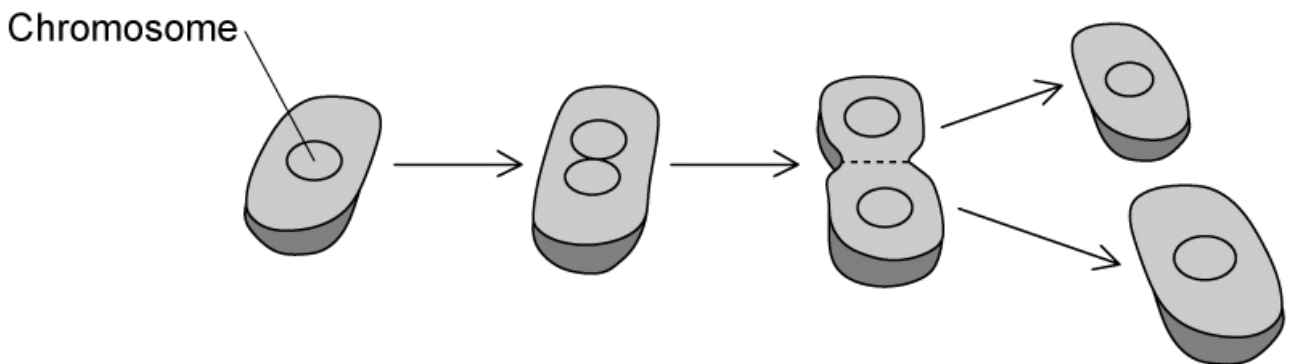
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(3 marks)

(d) State the name of the type of asexual reproduction that the prokaryotic cell in the diagram below is undergoing.



(1 mark)

3 (a) The first cells on Earth are thought to have arisen from non-living materials.

List **four** processes that scientists believe were required for the first cells to be formed.

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(4 marks)

(b) The improvements in scientific apparatus has led to developments in scientific research, including having a better understanding of the ultrastructure of cells.

State the piece of apparatus that enabled scientists to examine the ultrastructure of cells.

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(1 mark)

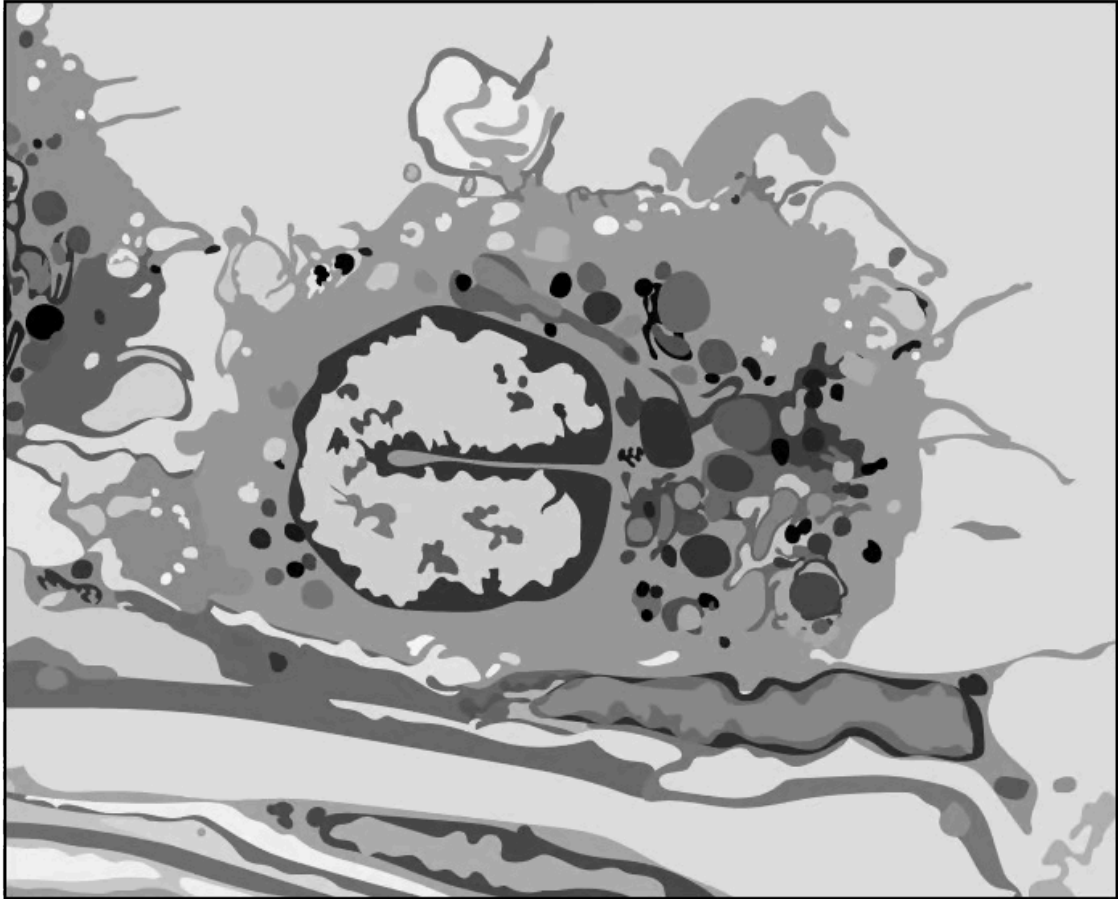
(c) List **two** structures found in both prokaryotic and eukaryotic cells.

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(2 marks)

4 (a) Outline, with a reason, the function of the specialised cell shown below.



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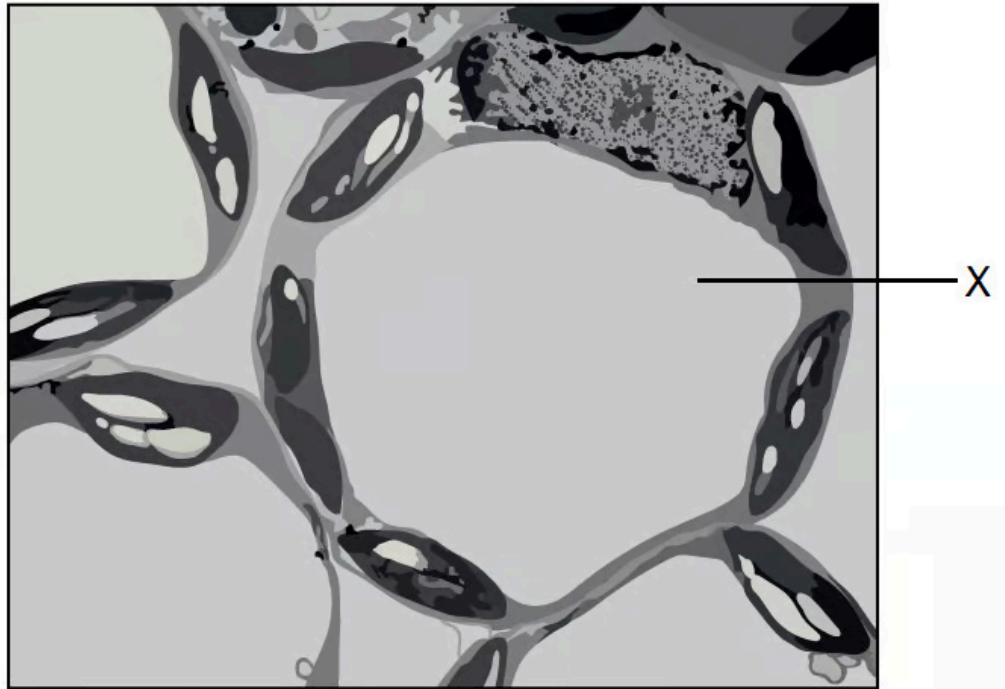
(3 marks)

(b) State which cell structure is shown below.



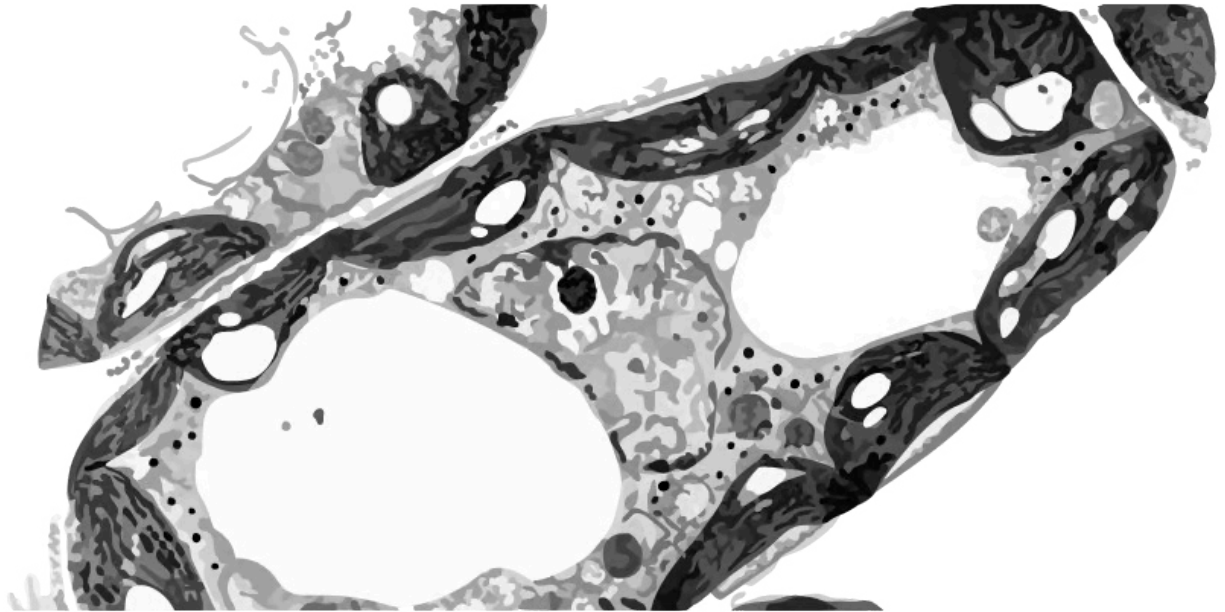
(1 mark)

(c) State the name the structure labelled X.



(1 mark)

5 (a) One mark is available for clarity of communication throughout this question. The diagram below shows an electron micrograph of a palisade mesophyll cell.



Draw a labelled diagram of this cell.

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(5 marks)

(b) Outline the evidence scientists have provided to explain the origin of eukaryotic cells.

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(4 marks)

(c) Outline the experiment used by Pasteur to demonstrate cells only come from pre-existing cells.

(6 marks)