EXAM PAPERS PRACTICE

IB Biology SL

Cells: Origin & Ultrastructure

Question Paper

"We will help you to achieve A Star "

Question 1

Which row correctly compares the magnification and resolution of an electron microscope with a light microscope?

	Magnification	Resolution
A.	Lower	Higher
B.	Higher	Lower
C.	Higher	Higher
D.	Lower	Lower

[1 mark]

Question 2

Which of the following can **not** be viewed using a light microscope?

A. Nucleus

B. Cell wall

C. Chloroplasts

D. Ribosomes

[1 mark]

Question 3

Which of the following correctly identifies the process that allows prokaryotic cells to reproduce?

A. Mitosis

B. Binary fission

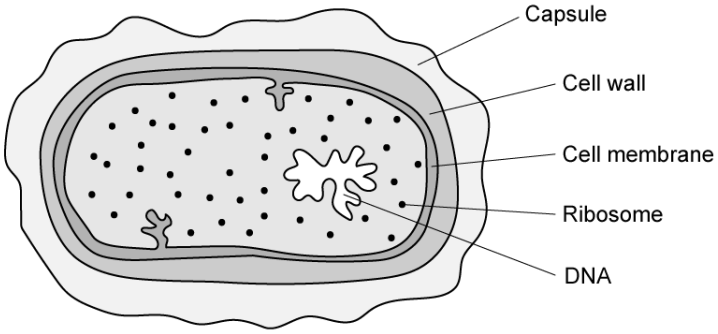
C. Fertilisation

D. Meiosis

[1 mark]

Question 4

The diagram shows a type of prokaryotic cell, a bacterium.



Which three structures are found in **both** an animal cell and this bacterium cell?

A. cell membrane, cell wall and DNA

B. cell membrane, DNA and ribosome

C. capsule, DNA and ribosome

D. capsule, cell membrane and cell wall

[1 mark]

Question 5

A giant bacterium, *Epulopiscium fishelsoni* was discovered in 1985.

Which cell structure(s) would enable biologists to classify *Epulopiscium* as prokaryotic?

A. Circular DNA and 70S ribosomes occurring freely in the cytoplasm and a cell wall made of murein.

B. A pair of centrioles close to the nuclear pore with 70S and 80S ribosomes occurring freely in the cytoplasm.

C. Smooth endoplasmic reticulum throughout the cytoplasm and a cell wall made of murein.

D. A cellulose cell wall outside the plasma membrane with 70S ribosomes and circular DNA occurring freely in the cytoplasm.

[1 mark]

Question 6

Which of the following is **not** a correct description of a light microscope or an electron microscope?

A An electron microscope can resolve specimens as small as 0.5 nm in diameter.

B A light microscope has a maximum resolution of 0.2 μm.

C An electron microscope has a maximum resolution of 0.05 nm.

D A light microscope can resolve specimens as small as 200 nm in diameter.

[1 mark]

Question 7

The list below contains structures that are all features of eukaryotic cells.

I. Nucleus
II. Endoplasmic reticulum
III. Lysosome
IV. Chloroplast
V. Mitochondrion

Which of these structures will have a double membrane?

A I, II and III

B I, III and IV

C I, IV and V

D II, III and IV

[1 mark]

Question 8

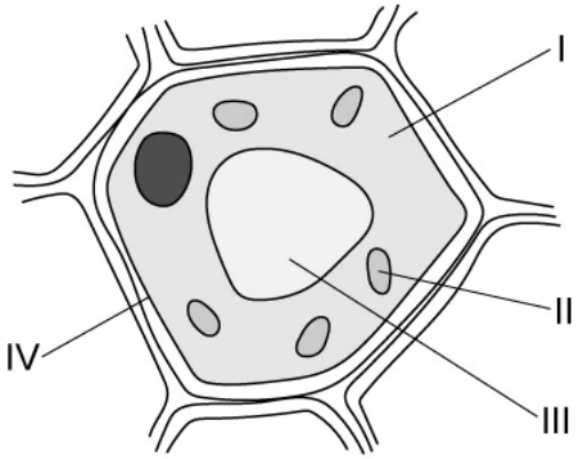
Which set of observations would indicate that a student is observing a eukaryotic cell?

	Cytoplasm includes endoplasmic reticulum	Protein molecules are associated with the DNA	Diameter <1 μm
A	X	✓	X
B	X	X	✓
C	✓	✓	X
D	✓	X	X

[1 mark]

Question 9

The diagram shows a typical plant cell.



Which of the cell components would be present in prokaryotes?

A I only

B II only

C II and III

D I and IV

[1 mark]

Question 10

Which of the following is evidence for the endosymbiotic theory?

A 70S ribosomes can be found in prokaryotic cells.

B Mitochondria contain their own DNA.

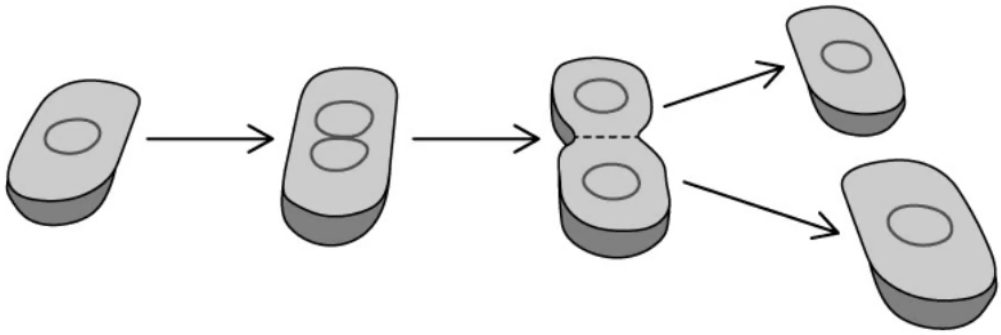
C Meteorites have been found that contain organic molecules.

D In certain cases, gene transfer from prokaryotic cells to eukaryotic cells via plasmids has been found to occur.

[1 mark]

Question 11

Which process is occurring in the diagram below?



A Binary fission

B Cytokinesis

C Mitosis

D Meiosis

[1 mark]

Question 12

The following statement describes some of Louis Pasteur's findings:

> Broth was first boiled, killing all organisms in it. The broth was then transferred to a swan-necked flask, which prevented organisms from entering. The result was that no organism subsequently grew in the broth. The swan-necked flask was then broken. The result was that mould subsequently grew in the broth.

What did these findings suggest?

A Mould needs nutrients in order to grow.

B Aerobic respiration requires the presence of oxygen.

C Mould is a form of microorganism.

D Spontaneous generation of cells does not occur.

[1 mark]

Question 13

Membrane-bound sacs containing products of metabolism are produced by the endoplasmic reticulum.

Where are these products used?

A Inside lysosomes only.

B Outside the cell only.

C Inside the cell only.

D Inside and outside the cell.

[1 mark]

Question 14

The table shows some possible units for measuring the diameters of alveoli, white blood cells and the width of cell walls.

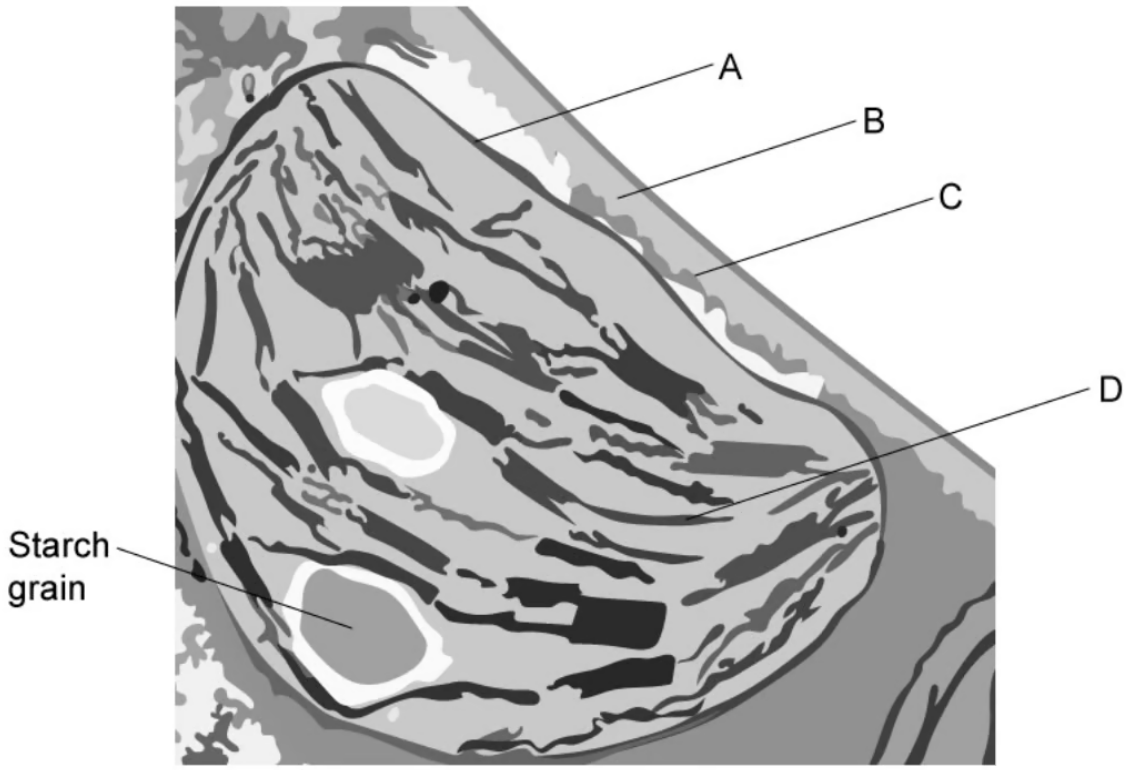
Which of the rows show the most suitable units for measuring each of these structures?

	Diameter of alveoli	Diameter of white blood cells	Width of cell walls
A	mm	µm	µm
B	mm	µm	nm
C	µm	nm	µm
D	µm	µm	nm

[1 mark]

Question 15

The electron micrograph below shows a section of part of a palisade mesophyll cell.



Which structure controls the exchange of substances into and out of the cell?

[1 mark]