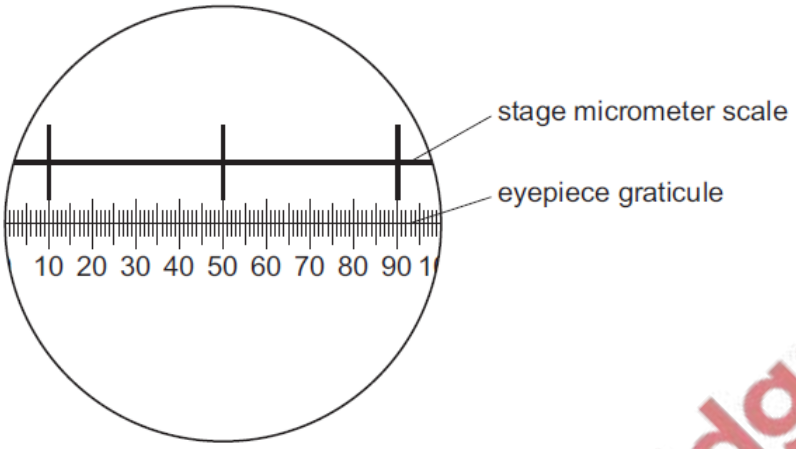
Cell Structure – AS 9700 Biology June 2022

1. June/2022/Paper_11/No.1

A student used a stage micrometer scale to calibrate an eyepiece graticule.

The diagram shows the view of both the stage micrometer scale and the eyepiece graticule seen by the student. The divisions on the stage micrometer scale are 0.1 mm apart.



The student removed the stage micrometer scale and viewed a slide with blood cells on it. The same lenses were used so that the magnification remained unchanged.

The student measured the diameter of one of the white blood cells on the slide using the eyepiece graticule and recorded that it was 8 eyepiece units.

What is the correct diameter of this white blood cell in micrometers?

A 0.2 **B** 0.8 **C** 20 **D** 800

2. June/2022/Paper_11/No.2

Four students were asked to match the function with the appearance of some cell structures in an animal cell.

The functions were listed by number.

1 mRNA passes through to the ribosome

2 produces the mitotic spindle during cell division

3 packaging of hydrolytic enzymes that will remain in the cell

The appearances were listed by letter.

V membranes which surround an enclosed inner cavity

W non-membrane-bound, spherical structures

X a double membrane interspersed with pores

Y non-membrane-bound, cylindrical structures

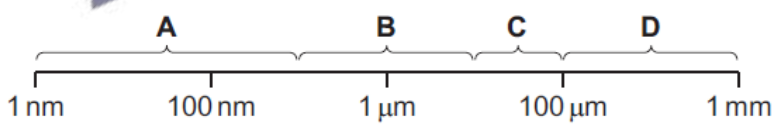
Z membrane-bound sacs, arranged as a flattened stack

Which student correctly matched the numbered function with the appearance of the cell structure?

	1	2	3
A	V	W	Y
B	V	Y	Z
C	X	W	Y
D	X	Y	Z

3. June/2022/Paper_11/No.3

Which size range would include most prokaryotic cells?



4. June/2022/Paper_11/No.4

What is present in a typical prokaryotic cell **and** a typical eukaryotic cell?

A 70S ribosomes

B centrioles

C circular DNA in the cytoplasm

D starch granules

5. June/2022/Paper_11/No.5

Which statement about viruses is correct?

A They all have a capsid made of protein.

B They all contain RNA.

C They all have an outer envelope made of phospholipids.

D They all contain 80S ribosomes.

6. June/2022/Paper_11/No.15

Some processes occurring in cells are listed.

1 endocytosis of water into cells

2 exocytosis of enzymes from cells

3 facilitated diffusion of glucose into red blood cells

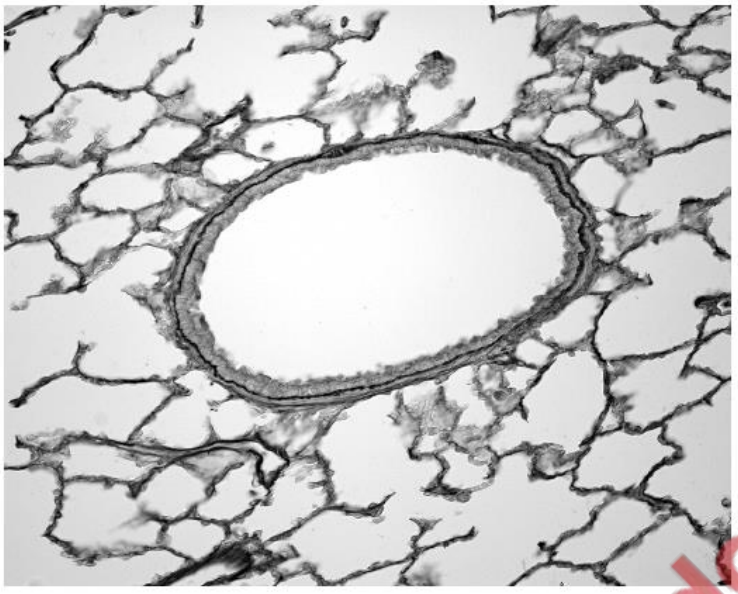
4 phagocytosis of dead cells by macrophages

Which processes use ATP?

A 1, 2 and 3 **B** 1, 2 and 4 **C** 1, 3 and 4 **D** 2, 3 and 4

7. June/2022/Paper_12/No.1

The photomicrograph shows a bronchiole and alveoli.



The magnification of the image is ×360.

What is the maximum diameter of the bronchiole lumen?

A 14 μm **B** 80 μm **C** 140 μm **D** 170 μm

8. June/2022/Paper_12/No.2

A specimen is observed twice with a microscope, firstly using green light with a wavelength of 510 nm and then using red light with a wavelength of 650 nm.

What happens to the magnification and resolution when using red light compared to green light?

	magnification	resolution
A	decreases	remains the same
B	increases	increases
C	remains the same	decreases
D	remains the same	increases

9. June/2022/Paper_12/No.3

Four students were asked to match the function with the appearance of some cell structures in an animal cell.

The functions were listed by number.

1 produces the mitotic spindle during cell division

2 synthesis of polypeptides

3 synthesis of lipids

The appearances were listed by letter.

V membranes which surround an enclosed inner cavity

W non-membrane-bound, spherical structures

X a double membrane interspersed with pores

Y non-membrane-bound, cylindrical structures

Z membrane-bound sacs, arranged as a flattened stack

Which student correctly matched the numbered functions with the appearance of the cell structure?

	1	2	3
A	W	X	Z
B	W	Z	V
C	Y	W	V
D	Y	Z	W

10. June/2022/Paper_12/No.4

What is found in chloroplasts and mitochondria?

A 70S ribosomes only

B 70S ribosomes and circular DNA

C 80S ribosomes and circular DNA

D circular DNA only

11. June/2022/Paper_12/No.5

Which feature is correct for all known viruses?

A capsid made of lipid and protein

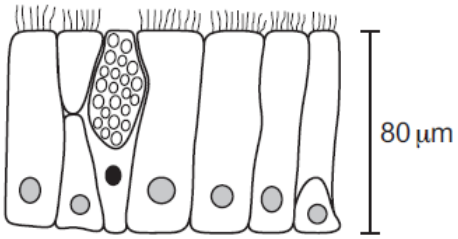
B DNA core

C outer envelope of phospholipid

D non-cellular structure

12. June/2022/Paper_13/No.1

The diagram shows a section through epithelium found in part of the respiratory system.



What is the magnification of the diagram?

A ×35 **B** ×350 **C** ×3500 **D** ×35 000

13. June/2022/Paper_13/No.2

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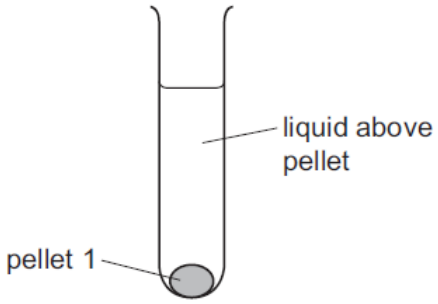
B	V	Z	Z
C	X	W	Z
D	X	Z	W

14. June/2022/Paper_13/No.3

An experiment was carried out to separate the cell structures in an animal cell.

The cells were broken open. The extract was filtered and put into a centrifuge tube. This tube was then spun so that the heaviest cell structure sank to the bottom first, forming pellet 1, as shown.



The liquid above pellet 1 was poured into a clean centrifuge tube and spun again at a higher speed to separate the next heaviest cell structure. This cell structure sank to the bottom, forming pellet 2.

This procedure was repeated twice to obtain pellet 3 and pellet 4, each containing a single cell structure.

What is a function of the cell structure extracted in pellet 1?

A digestion of old organelles

B production of ATP

C production of mRNA

D synthesis of protein

15. June/2022/Paper_13/No.5

Which row shows a comparison that is **not** correct between a typical prokaryotic cell and a typical eukaryotic plant cell?

	prokaryotic cell	eukaryotic plant cell
A	DNA not associated with histones	DNA associated with histones
B	no endoplasmic reticulum present	endoplasmic reticulum present
C	peptidoglycan cell walls	cellulose cell walls
D	all ribosomes approximately 18 nm in diameter	all ribosomes approximately 22 nm in diameter

16. June/2022/Paper_13/No.6

It is suggested that primitive prokaryotic cells may be ancestors of certain organelles in eukaryotic cells.

Which organelle is most similar in composition to a typical prokaryote?

A Golgi bodies

B lysosomes

C mitochondria

D nucleoli

17. June/2022/Paper_23/No.1

The trachea of the gas exchange system branches into two airways, each of which enters a lung.

(a) Name the airways that branch from the trachea to enter the lungs.

..... [1]

(b) The lower part of the trachea receives blood from arteries that branch from the aorta. Different arteries carry blood from the heart to the alveoli of the lungs.

State the differences between the arteries supplying the lower part of the trachea and the arteries that supply blood to the alveoli of the lungs.

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..... [2]

(c) Fig. 1.1 is a photomicrograph of a section through part of the trachea.

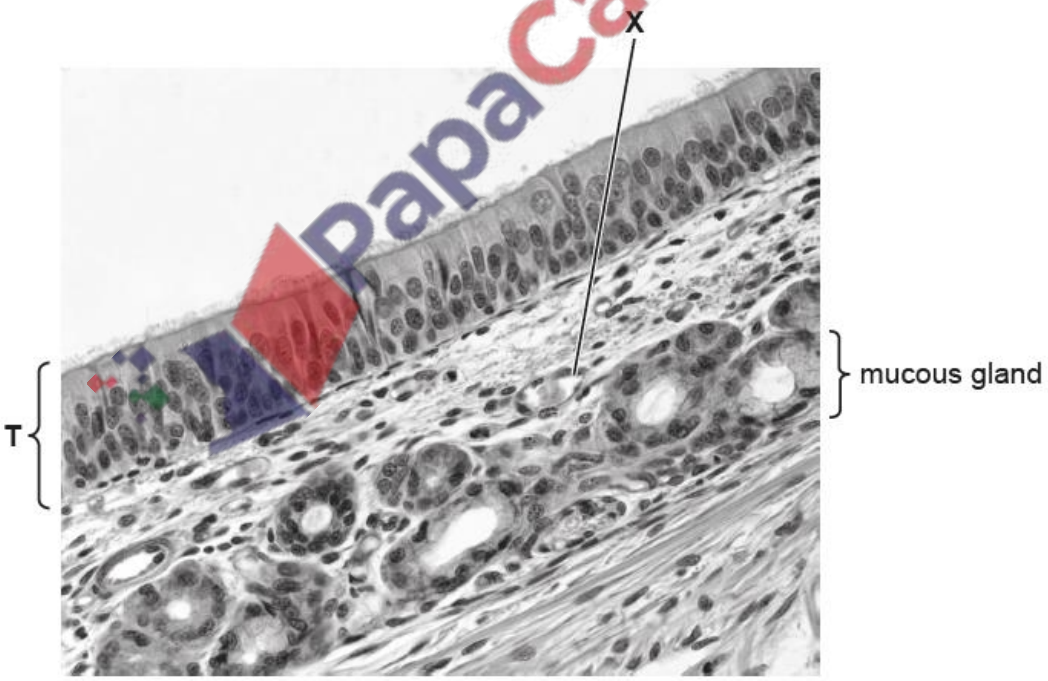

Fig. 1.1

(i) In Fig. 1.1, one of the tissues in the trachea is labelled **T**.

Describe the structural features of tissue **T** visible in Fig. 1.1.

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..... [3]

(ii) Identify structure **X** in Fig. 1.1 **and** outline the features that helped your identification.

structure **X** = ...

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..... [3]

[Total: 9]