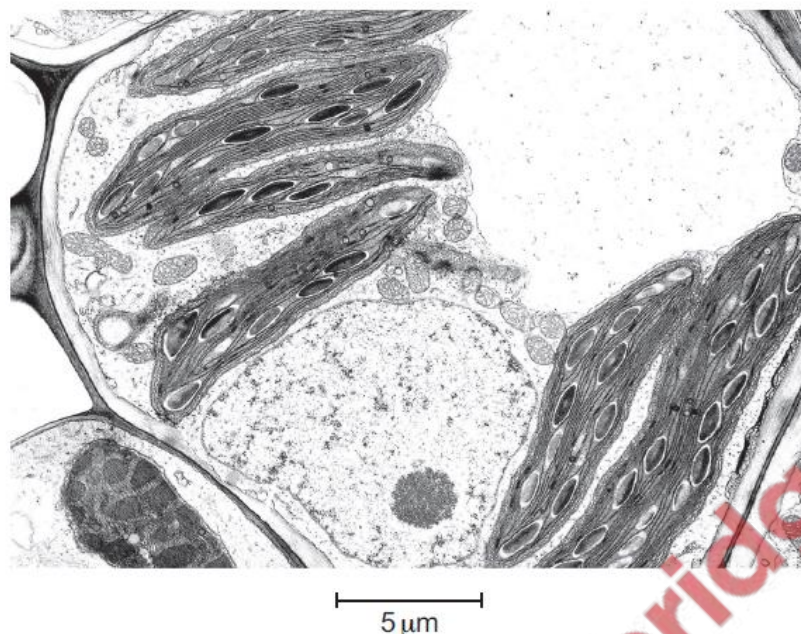


**1. Nov/2022/Paper\_11/No.1**

The photomicrograph shows part of a plant cell.



What is the magnification of the cell?

- A** ×250      **B** ×400      **C** ×1000      **D** ×4000

**2. Nov/2022/Paper\_11/No.12**

Which row matches each organelle with its function?

	microtubules	rough endoplasmic reticulum	Golgi body	centrioles
<b>A</b>	make cilia and spindle	separates some processes from cytoplasm	makes lysosomes	assemble the spindle during nuclear division
<b>B</b>	move vesicles within the cell	assembles amino acids to make proteins	contains enzymes for destroying worn out parts of the cell	move chromosomes apart during anaphase
<b>C</b>	move chromatids apart during anaphase	modifies proteins which may be released from cell	makes glycoproteins	move cilia
<b>D</b>	form part of the cytoskeleton	makes triglycerides and phospholipids	modifies proteins by adding carbohydrates	move individual cells

3. Nov/2022/Paper\_11/No.3

Where are 80S ribosomes found?

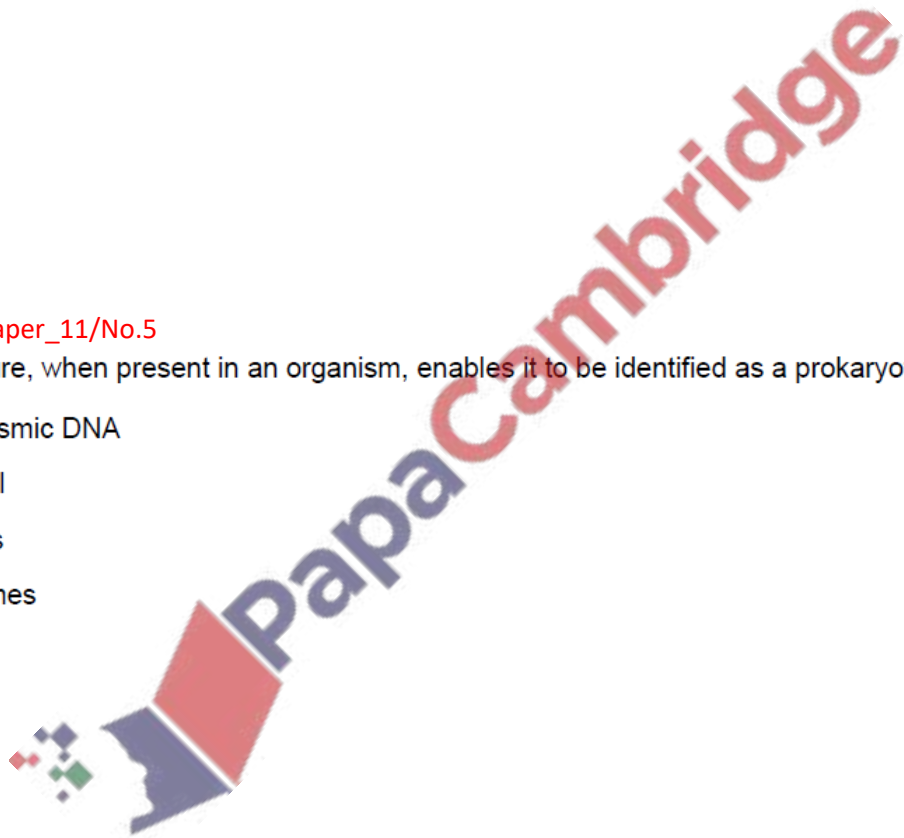
- 1 chloroplasts
- 2 cytoplasm of eukaryotes
- 3 mitochondria
- 4 cytoplasm of prokaryotes

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

4. Nov/2022/Paper\_11/No.5

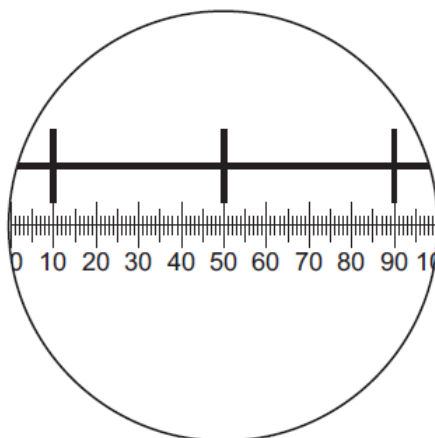
Which feature, when present in an organism, enables it to be identified as a prokaryote?

- A cytoplasmic DNA
- B cell wall
- C nucleus
- D ribosomes



5. Nov/2022/Paper\_12/No.1

The diagram shows a stage micrometer, with divisions 0.10mm apart, viewed through an eyepiece containing a graticule.



The area of the field of view of the microscope can be calculated using this formula.

$$\text{area} = \pi r^2$$

A student calculated the area of the field of view of the microscope using the information provided and a value for  $\pi$  of 3.142.

Which answer has been rounded correctly to an appropriate number of significant figures?

- A 0.04909 mm<sup>2</sup>
- B  $5 \times 10^{-2}$  mm<sup>2</sup>
- C  $4.909 \times 10^4$   $\mu\text{m}^2$
- D  $4.91 \times 10^4$   $\mu\text{m}^2$

6. Nov/2022/Paper\_12/No.2

Where are cisternae found in a cell?

- 1 endoplasmic reticulum
- 2 Golgi body
- 3 mitochondria

- A 1 and 2
- B 1 and 3
- C 1 only
- D 2 and 3

7. Nov/2022/Paper\_12/No.3

Which row matches the functions to the cell structures?

	vacuole	nucleolus	ribosomes	lysosomes
<b>A</b>	stores water, sugar and pigment	manufactures messenger RNA	protein synthesis	involved in cell recognition
<b>B</b>	exports proteins	manufactures ribosomal RNA	lipid synthesis	involved in cell recognition
<b>C</b>	stores water, sugar and pigment	manufactures ribosomal RNA	protein synthesis	contains enzymes
<b>D</b>	exports proteins	manufactures messenger RNA	lipid synthesis	contains enzymes

8. Nov/2022/Paper\_12/No.4

Which structures are found in prokaryotes and eukaryotes?

- A** cell membrane and nucleus
- B** cell membrane and ribosomes
- C** nucleus and mitochondria
- D** mitochondria and ribosomes

9. Nov/2022/Paper\_12/No.12

The photomicrograph shows the appearance of onion epidermal cells after they have been soaked in solution X for one hour.

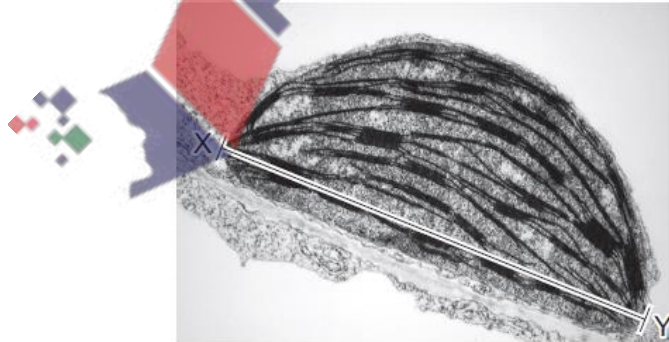


What fills the space labelled Y?

- A air
- B cytoplasm
- C solution X
- D water

10. Nov/2022/Paper\_13/No.1

The electron micrograph shows a chloroplast from a tobacco leaf.



If the actual length of this chloroplast measured along X–Y is  $10\ \mu\text{m}$ , what is the magnification of the image?

- A  $\times 6.3$
- B  $\times 63$
- C  $\times 630$
- D  $\times 6300$

11. Nov/2022/Paper\_13/No.12

Some cell structures are listed.

- 1 endoplasmic reticulum
- 2 Golgi body
- 3 mitochondrion
- 4 chloroplast

Which cell structures do **not** contain cristae?

- A 1, 2, 3 and 4
- B 1, 2 and 4 only
- C 1 and 2 only
- D 3 and 4 only

12. Nov/2022/Paper\_13/No.4

Which row is correct for typical prokaryotic cells **and** mitochondria?

	feature	prokaryotic cells	mitochondria
A	70S ribosomes	no	yes
B	circular DNA	yes	no
C	peptidoglycans	yes	no
D	small size, 1–5 $\mu\text{m}$ long	no	no

13. Nov/2022/Paper\_13/No.5

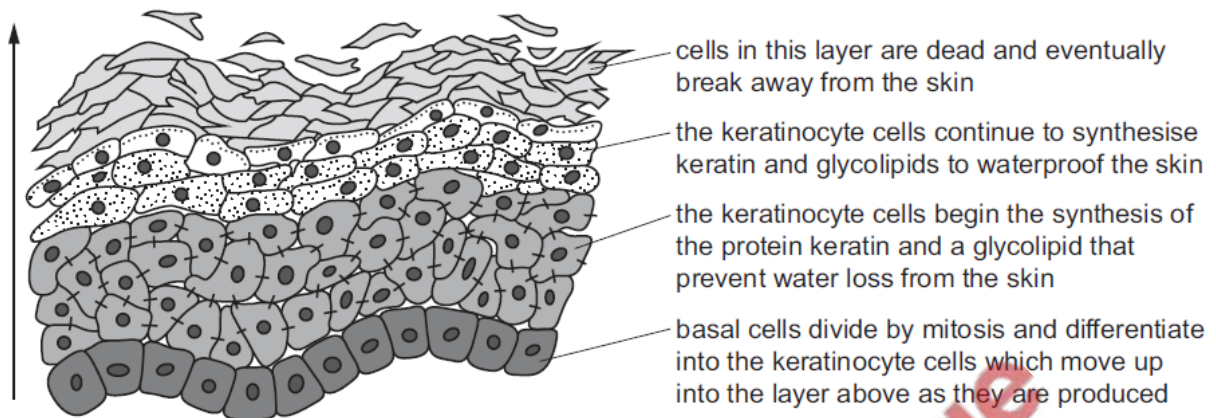
Which statement is correct?

- A A virus is composed of a protein coat which surrounds RNA or DNA.
- B Suberin and cellulose are found in all plant cell walls.
- C Plasmodesmata and centrioles are found in all plant cells.
- D Prokaryotic cells contain an endoplasmic reticulum to synthesise proteins.



The diagram shows the epidermis of human skin. This is formed of four layers of cells.

Cells in each layer have specific functions which are outlined on the diagram. As the cells are produced, they move upwards as shown by the arrow.



Which row shows cells that are acting as stem cells in the skin epidermis and an organelle needed by the keratinocytes?

	cells that are acting as stem cells	organelle needed by the keratinocytes
<b>A</b>	basal cells only	centrioles
<b>B</b>	basal cells only	Golgi body
<b>C</b>	basal cells and keratinocytes	centrioles
<b>D</b>	basal cells and keratinocytes	Golgi body



(a) Fig. 1.1 is a transmission electron micrograph showing a section of a human liver cell.



Fig. 1.1

(i) Name organelles **A** and **B** shown in Fig. 1.1.

**A** .....

**B** .....

[2]

(ii) In liver cells, enzymes are attached to the membrane of smooth endoplasmic reticulum.

With reference to the functions of smooth endoplasmic reticulum, suggest the advantages of having enzymes attached to the membrane rather than free in the lumen.

.....  
.....  
.....  
.....  
.....  
.....

[3]



(b) Explain the advantages of using a transmission electron microscope compared with a light microscope when viewing a liver cell.

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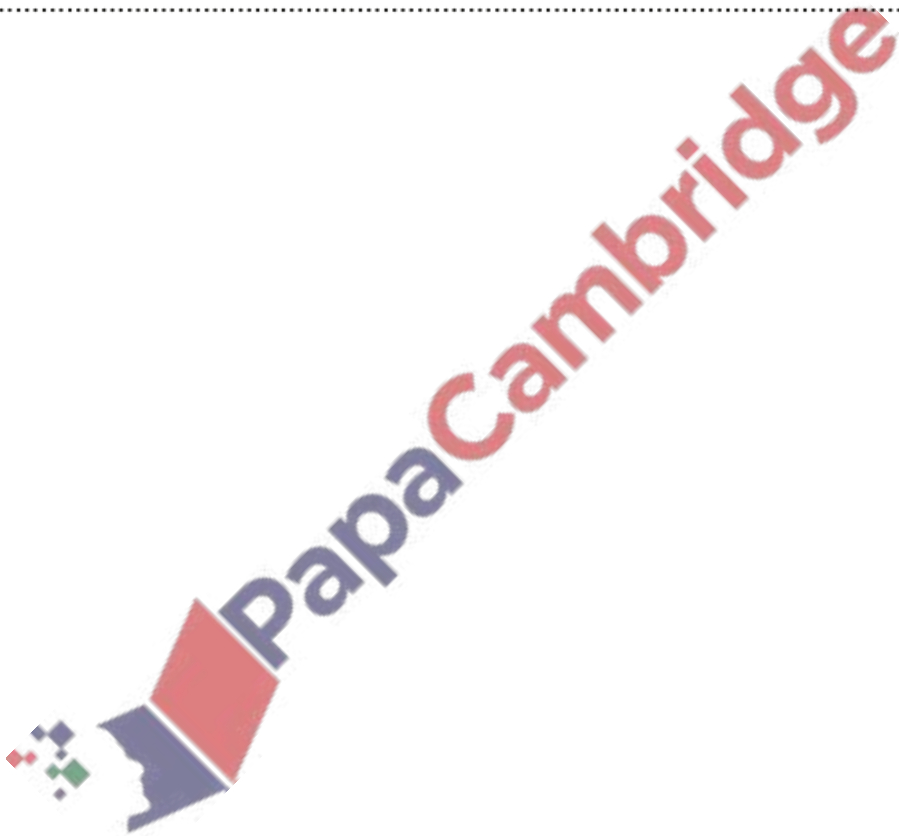
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[3]

[Total: 8]



Human cytomegalovirus (HCMV) is a common virus affecting humans. In people with a fully functioning immune system, infection by HCMV usually causes no, or only mild, symptoms.

Fig. 2.1A is a diagram of a section through HCMV. In Fig. 2.1B, only the outer part of HCMV is sectioned.

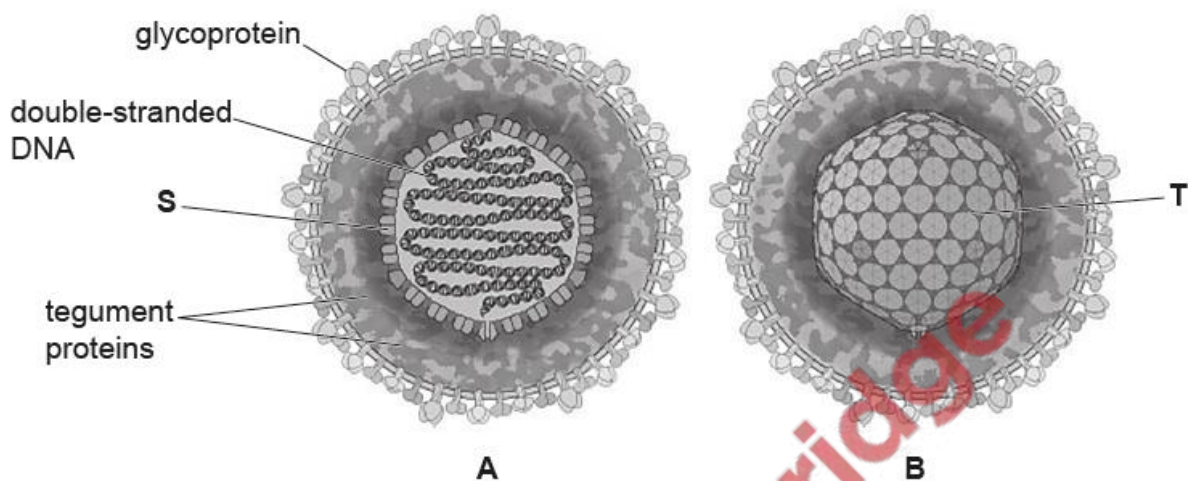


Fig. 2.1

The viral DNA shown in Fig. 2.1 contains genes that code for proteins important in viral replication and viral structure, including viral DNA polymerase and proteins known as tegument proteins.

Viruses can only replicate in host cells as they need to use processes and contents of the host cell. Complete viral particles that are released from the host cell are known as virions.

(a) Structure **S** in Fig. 2.1A is a subunit of structure **T** in Fig. 2.1B.

Name the chemical compound used to make structure **S** and name structure **T**.

**S** .....

**T** ..... [2]

(b) The actual diameter of the HCMV shown in Fig. 2.1 is 0.17 micrometres ( $\mu\text{m}$ ).

Calculate the actual diameter of the virus in nanometres (nm).

..... [1]

(c) Suggest the role of viral DNA polymerase within the host cell.

..... [1]

17. Nov/2022/Paper\_22/No.5(b)

(b) After final processing in the Golgi body, collagen is released to the outer surface of the cell by exocytosis.

Complete the passage to describe the process of exocytosis.

After final processing in the Golgi body,  
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.....  
.....  
.....  
.....  
.....  
.....  
.....  
..... [3]

