A LEVEL Cambridge Topical Past Papers

BIOLOGY

2017 — 2023

P1

BIOLOGY 9700

TOPICAL PAST PAPER WORKSHEETS

2017 - 2023 | Questions + Mark scheme

AVAILABLE PAPERS

P1	P2	P4
1676 Questions	409 Questions	403 Questions

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TOPICS	P1	P2	P4
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THE MITOTIC CELL CYCLE	127	33	9
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1 - (9700/11_Summer_2017_Q1) - *Cell Structure*

Which definition of the magnification of a drawing of a leaf is correct?

A the actual size of an object multiplied by the magnification of the microscope

B the difference in size between an actual object and a drawing of the object

C the increase in size of an object when observed using a microscope

D the size of the drawing of a specimen in comparison to the actual size

2 - (9700/12_Summer_2017_Q1) - *Cell Structure*

Which organelles are enclosed in a single phospholipid bilayer and contain hydrolytic enzymes?

A endocytotic vesicles

B Golgi body

C lysosomes

D mitochondria

3 - (9700/13_Summer_2017_Q1) - *Cell Structure*

Where are cisternae found in a cell?

1 endoplasmic reticulum

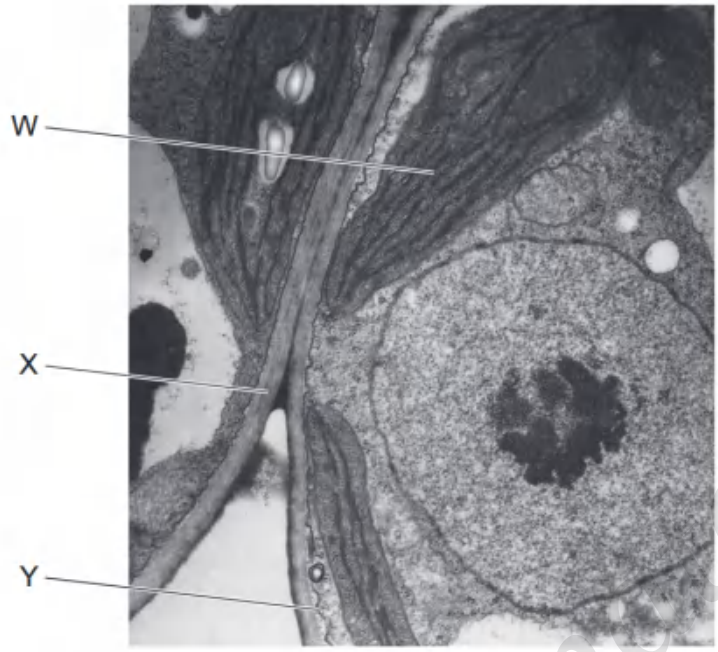
2 Golgi body

3 mitochondrion

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

4 – (9700/11_Summer_2017_Q2) – *Cell Structure*

The electron micrograph shows part of two cells.



Which labelled features identify these cells as eukaryotic?

A W, X and Y **B** W and X only **C** W only **D** X only

5 – (9700/12_Summer_2017_Q2) – *Cell Structure*

The DNA of prokaryotes is naked and circular.

Which statement describes how the DNA of eukaryotes differs from that of prokaryotes?

A It has a nuclear envelope around it and is a double helix.

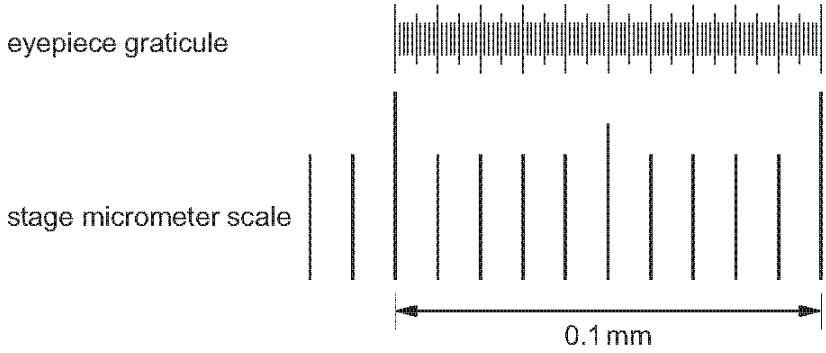
B It has a nuclear envelope around it and is circular.

C It has proteins attached to it and is a double helix.

D It has proteins attached to it and is linear.

6 - (9700/13_Summer_2017_Q2) - *Cell Structure*

The diagram shows an eyepiece graticule and part of a stage micrometer scale as seen using ×100 magnification.



How is the value, in μm, of one eyepiece graticule unit calculated?

A divide 100 by 0.1 and multiply by 1000

B divide 100 by 0.1 and multiply by 1000 divided by 100

C multiply 0.1 by 1000 and divide by 100

D multiply 0.1 by 1000 and divide by 100 then divide again by 100

7 - (9700/11_Summer_2017_Q3) - *Cell Structure*

Plant cells are fixed, stained and viewed using a student microscope. The light source was natural light.

What would be clearly visible at ×400 magnification?

A cristae of mitochondria

B grana of chloroplasts

C nucleoli

D ribosomes

8 - (9700/12_Summer_2017_Q3) - *Cell Structure*

The recently discovered *Pandoravirus* measures 1000 nm in diameter.

The *Mimivirus* has a diameter of 400 nm.

What can be detected using a light microscope with a maximum resolution of 0.25 μm?

A both the *Mimivirus* and the *Pandoravirus*

B neither the *Mimivirus* nor the *Pandoravirus*

C the *Mimivirus,* but not the *Pandoravirus*

D the *Pandoravirus*, but not the *Mimivirus*

9 – (9700/13_Summer_2017_Q3) – *Cell Structure*

It is possible for a bacterium to synthesise a eukaryotic protein.

This involves introducing a eukaryotic gene into the bacterial DNA, which can be translated.

What explains why a bacterial cell can produce a eukaryotic protein but cannot produce a eukaryotic glycoprotein?

A Bacteria do not have 70S ribosomes.

B Bacteria do not have a nuclear envelope.

C Bacteria do not have Golgi bodies.

D Bacteria do not have mitochondria.

10 – (9700/11_Summer_2017_Q4) – *Cell Structure*

Which lengths are equivalent to 1 μm?

1 1000 mm

2 0.001 nm

3 0.001 mm

4 1 000 000 nm

5 0.01 mm

6 1000 nm

A 1 and 4 **B** 2 and 5 **C** 3 and 4 **D** 3 and 6

11 – (9700/12_Summer_2017_Q4) – *Cell Structure*

What are found in chloroplasts **and** mitochondria?

1 DNA

2 70S ribosomes

3 mRNA

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

12 – (9700/13_Summer_2017_Q4) – *Cell Structure*

Which structures are found in **both** typical eukaryotic cells **and** typical prokaryotic cells?

1 70S ribosomes
2 80S ribosomes
3 circular DNA

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

13 – (9700/11_Summer_2017_Q5) – *Cell Structure*

Some secretory cells synthesise and release glycoproteins.

What is the correct order of the sequence of events as they occur in the secretory cell?

1 exocytosis
2 product accumulates in secretory vesicle
3 mRNA binds to ribosomes
4 synthesis of glycoprotein

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

14 – (9700/12_Summer_2017_Q5) – *Cell Structure*

Boiling the bones and teeth from dead animals can be used to produce a type of glue.

The glue is formed from the collagen fibres present in bones and teeth.

Which statement describes the changes to collagen that occur when the glue is produced?

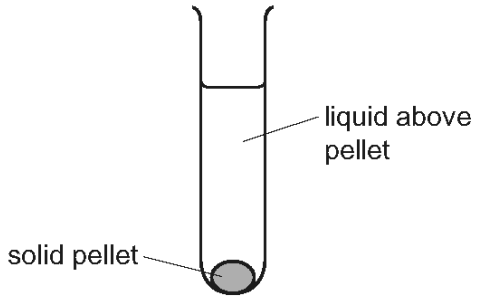
A The fibres of collagen become more coiled.
B The fibres of collagen become more flexible.
C The helices of collagen molecules unwind.
D The molecules of collagen dissolve in water.

15 – (9700/11_Summer_2017_Q6) – *Cell Structure*

A scientist carried out an experiment to separate the organelles in an animal cell by mass.

The scientist mixed the cells with a buffer solution which had the same water potential as the cells. He then broke the cells open with a blender to release the organelles.

The extracted mixture was filtered and then spun in a centrifuge at a speed to separate the heaviest organelle. This sank to the bottom, forming a solid pellet, 1.



The liquid above pellet 1 was poured into a clean centrifuge tube and spun in the centrifuge at a higher speed to separate the next heaviest organelle. This organelle sank to the bottom, to form a solid pellet, 2.

He repeated this procedure twice more to obtain pellet 3 and pellet 4, each containing a single organelle.

What is the function of the organelle extracted in pellet 3?

A digestion of old organelles

B production of ATP

C synthesis of mRNA

D synthesis of protein

16 – (9700/12_Summer_2017_Q6) – *Cell Structure*

What describes the primary structure of a protein?

A α-helix

B a dipeptide

C a globular structure

D the specific order of amino acids

17 - (9700/11_Winter_2017_Q1) - *Cell Structure*

Which row is correct for a typical plant cell?

	cell wall	cell diameter	ribosomes
A	cellulose	1-5 μm	80S
B	cellulose	5-40 μm	70S and 80S
C	peptidoglycan	1-5 μm	70S
D	peptidoglycan	5-40 μm	70S and 80S

18 - (9700/12_Winter_2017_Q1) - *Cell Structure*

Which equation for calculating the actual size of a specimen, A, or image size, I, or magnification, M, is correct?

A $A = M \div I$ **B** $A = I \times M$ **C** $I = M \div A$ **D** $M = I \div A$

19 - (9700/13_Winter_2017_Q1) - *Cell Structure*

Which statement about the light microscope is correct?

A As the smallest distance to see two points as distinct separate points decreases, the resolution also decreases.

B If the resolution is 220 nm, then a bacterium 0.2 μm in diameter will not be visible.

C If the wavelength of light is 600 nm, then two membranes 300 nm apart will be visible as two distinct membranes.

D Using visible light of a longer wavelength, such as red light, will improve the resolution.

20 - (9700/11_Winter_2017_Q2) - *Cell Structure*

An electron micrograph of a cell shows large quantities of rough endoplasmic reticulum and many Golgi bodies.

What type of cell is being viewed?

A bacterium

B guard cell

C lymphocyte

D mesophyll

ANSWERS

1 – (9700/11_Summer_2017_Q1) – *Cell Structure*

D

2 – (9700/12_Summer_2017_Q1) – *Cell Structure*

C

3 – (9700/13_Summer_2017_Q1) – *Cell Structure*

A

4 – (9700/11_Summer_2017_Q2) – *Cell Structure*

C

5 – (9700/12_Summer_2017_Q2) – *Cell Structure*

D

6 – (9700/13_Summer_2017_Q2) – *Cell Structure*

C

7 – (9700/11_Summer_2017_Q3) – *Cell Structure*

C

8 – (9700/12_Summer_2017_Q3) – *Cell Structure*

A

9 – (9700/13_Summer_2017_Q3) – *Cell Structure*

C

10 – (9700/11_Summer_2017_Q4) – *Cell Structure*

D

11 – (9700/12_Summer_2017_Q4) – *Cell Structure*

A

12 – (9700/13_Summer_2017_Q4) – *Cell Structure*

B

13 – (9700/11_Summer_2017_Q5) – *Cell Structure*

B

14 – (9700/12_Summer_2017_Q5) – *Cell Structure*

C

15 – (9700/11_Summer_2017_Q6) – *Cell Structure*

A

16 – (9700/12_Summer_2017_Q6) – *Cell Structure*

D

17 – (9700/11_Winter_2017_Q1) – *Cell Structure*

B

18 – (9700/12_Winter_2017_Q1) – *Cell Structure*

D

19 – (9700/13_Winter_2017_Q1) – *Cell Structure*

B