

# TOPICAL PAST PAPER WORKBOOK

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## IGCSE Combined Science (0653) Paper 2 [MCQ]

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Years: 2019 - 2021



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# Introduction

Each topical past paper book consists of hundreds of questions and their answer schemes, in the form of worksheets. Questions are assigned to each chapter according to their corresponding topic. Topics, in turn, are based on the items of the latest Cambridge IGCSE or AS/A level syllabus content. This book's specifications are as follows:

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Number of questions: 680



# Contents

<b>1</b>	<b>Biology</b>	<b>7</b>
1.1	Characteristics of living organisms . . . . .	7
1.2	Cells . . . . .	8
1.3	Biological molecules . . . . .	18
1.4	Enzymes . . . . .	20
1.5	Plant nutrition . . . . .	24
1.6	Animal nutrition . . . . .	30
1.7	Transport . . . . .	37
1.8	Gas exchange and respiration . . . . .	44
1.9	Coordination and response . . . . .	50
1.10	Reproduction . . . . .	60
1.11	Organisms and their environment . . . . .	80
1.12	Human influences on ecosystems . . . . .	87
<b>2</b>	<b>Chemistry</b>	<b>91</b>
2.1	The particulate nature of matter . . . . .	91
2.2	Experimental techniques . . . . .	93
2.3	Atoms, elements and compounds . . . . .	99
2.4	Stoichiometry . . . . .	109
2.5	Electricity and chemistry . . . . .	113
2.6	Energy changes in chemical reactions . . . . .	117
2.7	Chemical reactions . . . . .	124
2.8	Acids, bases and salts . . . . .	133
2.9	The Periodic Table . . . . .	141
2.10	Metals . . . . .	148
2.11	Air and water . . . . .	155
2.12	Organic chemistry . . . . .	160
<b>3</b>	<b>Physics</b>	<b>167</b>
3.1	Motion . . . . .	167
3.2	Work, energy and power . . . . .	188
3.3	Thermal Physics . . . . .	194
3.4	Properties of waves, including light and sound . . . . .	206
3.5	Electrical quantities . . . . .	226
3.6	Electric circuits . . . . .	236
<b>A</b>	<b>Answers</b>	<b>251</b>



# Chapter 1

## Biology

### 1.1 Characteristics of living organisms

1. 0653\_m21\_qp\_22 Q: 1

What are the characteristics of living organisms?

	excretion	growth	movement	nutrition	reproduction	respiration	sensitivity /response
<b>A</b>	✓	✓	✓	✓	✓	✓	✓
<b>B</b>	✓	✓	X	✓	✓	✓	✓
<b>C</b>	✓	X	X	✓	X	✓	✓
<b>D</b>	X	✓	✓	✓	✓	✓	X

2. 0653\_w19\_qp\_21 Q: 1

A biologist keeps a potted plant in a laboratory.

Which feature of the potted plant shows that it is a living organism?

- A** It grows larger over time.
- B** It has green leaves.
- C** The compost in the pot dries after he waters it.
- D** The stems contain xylem.

3. 0653\_w19\_qp\_22 Q: 1

A biologist keeps a potted plant in a laboratory.

Which feature of the potted plant shows that it is a living organism?

- A** It grows larger over time.
- B** It has green leaves.
- C** The compost in the pot dries after he waters it.
- D** The stems contain xylem.

4. 0653\_w19\_qp\_23 Q: 1

A biologist keeps a potted plant in a laboratory.

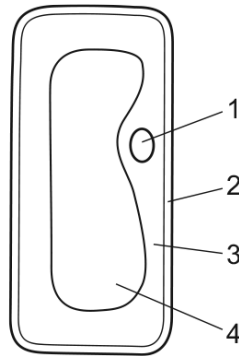
Which feature of the potted plant shows that it is a living organism?

- A It grows larger over time.
  - B It has green leaves.
  - C The compost in the pot dries after he waters it.
  - D The stems contain xylem.
- 

## 1.2 Cells

5. 0653\_m21\_qp\_22 Q: 2

The diagram shows a plant cell.



Which structures are also found in an animal cell?

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

6. 0653\_m21\_qp\_22 Q: 3

An animal cell is placed in a solution with a water potential lower than its cytoplasm.

Which statement correctly describes the movement of water across the cell membrane?

- A equal movement in and out of the cell
  - B net movement into the cell
  - C net movement out of the cell
  - D no movement in or out of the cell
-



7. 0653\_s21\_qp\_21 Q: 1

Which row correctly matches a named cell with its feature and function?

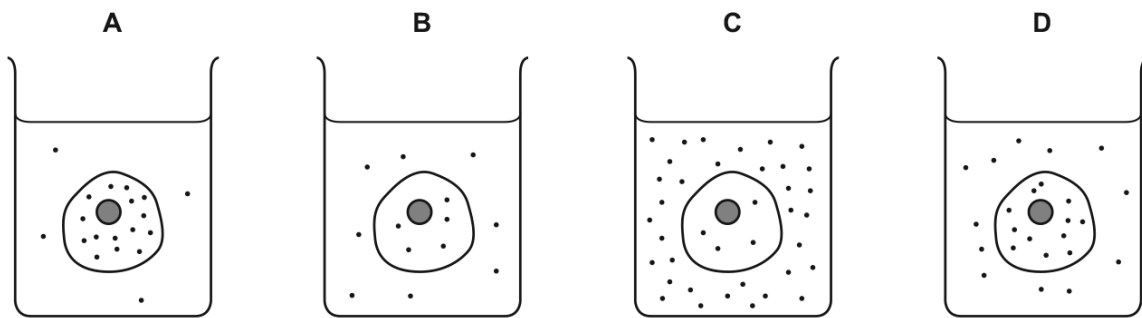
	cell	feature	function
<b>A</b>	ciliated cell	flagellum	absorbs water
<b>B</b>	palisade mesophyll cell	chloroplasts	transports oxygen
<b>C</b>	red blood cell	large surface area	phagocytosis
<b>D</b>	sperm cell	flagellum	reproduction

8. 0653\_s21\_qp\_21 Q: 2

The diagrams represent four similar animal cells immersed in blood plasma.

The black dots represent molecules of dissolved oxygen.

Which cell will have oxygen molecules diffusing into it most rapidly?



9. 0653\_s21\_qp\_22 Q: 1

Which row correctly identifies the function of a ciliated cell in the bronchus of a healthy human?

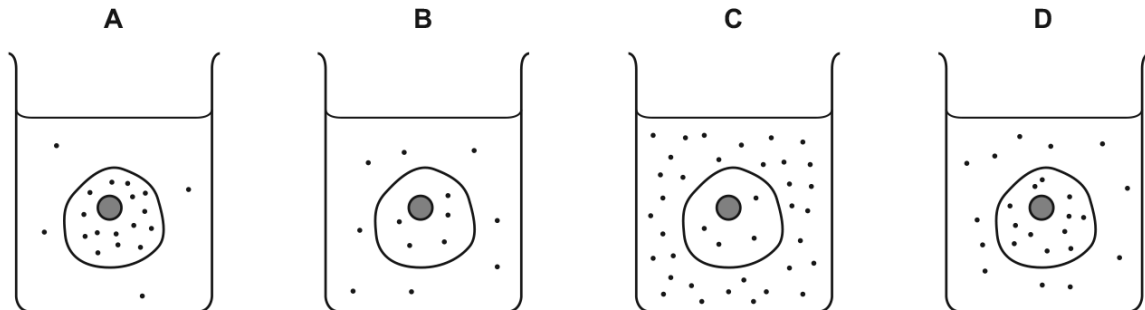
	substance being moved	direction of movement
<b>A</b>	air	towards bronchioles
<b>B</b>	air	towards trachea
<b>C</b>	mucus	towards bronchioles
<b>D</b>	mucus	towards trachea

10. 0653\_s21\_qp\_22 Q: 2

The diagrams represent four similar animal cells immersed in blood plasma.

The black dots represent molecules of dissolved oxygen.

Which cell will have oxygen molecules diffusing into it most rapidly?



11. 0653\_s21\_qp\_23 Q: 1

Which row links a specialised cell to its correct function?

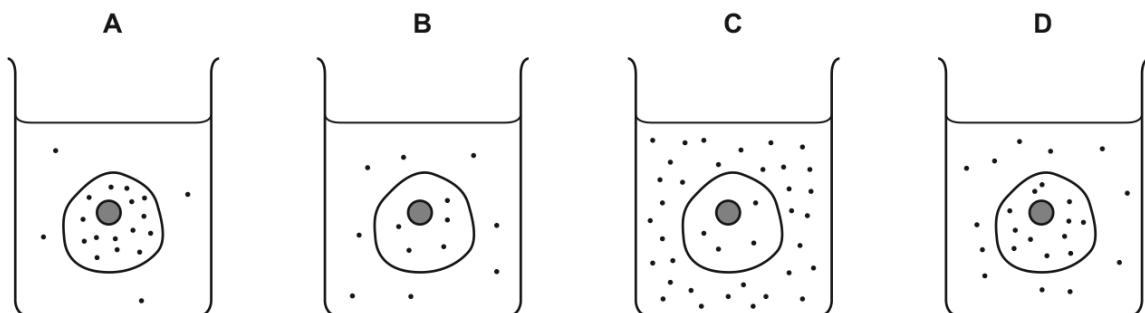
	specialised cell	function
<b>A</b>	ciliated cell	photosynthesis
<b>B</b>	palisade cell	movement of mucus
<b>C</b>	red blood cell	blood clotting
<b>D</b>	sperm cell	reproduction

12. 0653\_s21\_qp\_23 Q: 2

The diagrams represent four similar animal cells immersed in blood plasma.

The black dots represent molecules of dissolved oxygen.

Which cell will have oxygen molecules diffusing into it most rapidly?



13. 0653\_m20\_qp\_22 Q: 1

Which row shows the features of a plant cell?

	cell membrane surrounding the cell wall	cell wall surrounding the cell membrane	vacuole present
<b>A</b>	✓	✗	✓
<b>B</b>	✗	✓	✓
<b>C</b>	✓	✗	✗
<b>D</b>	✗	✓	✗

14. 0653\_s20\_qp\_21 Q: 1

The cytoplasm of a plant cell contains a 15% sugar solution. The plant cell is placed in sugar solutions of different concentrations.

In which solution would there be a net diffusion of water out of the cell?

- A** 5% sugar solution
- B** 10% sugar solution
- C** 15% sugar solution
- D** 20% sugar solution

15. 0653\_s20\_qp\_21 Q: 2

Which row matches the adaptation of a root hair cell to its function?

	adaptation	function
<b>A</b>	large surface area	uptake of water and glucose
<b>B</b>	large surface area	uptake of water and ions
<b>C</b>	small surface area	uptake of water and glucose
<b>D</b>	small surface area	uptake of water and ions

16. 0653\_s20\_qp\_21 Q: 5

Which features are found in a typical animal cell?

	cell membrane	cell wall	chloroplast	cytoplasm	nucleus	vacuole
<b>A</b>	✓	✓	✓	✓	✗	✗
<b>B</b>	✓	✗	✗	✓	✓	✓
<b>C</b>	✓	✗	✗	✓	✓	✗
<b>D</b>	✗	✓	✓	✗	✗	✓

17. 0653\_s20\_qp\_21 Q: 6

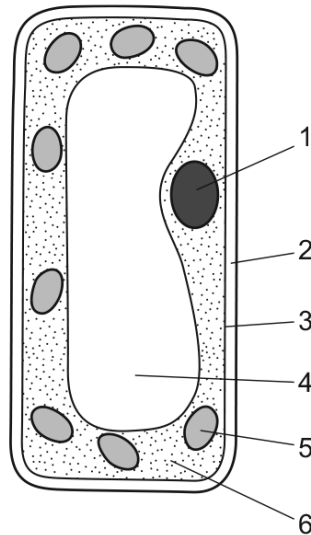
Which feature of red blood cells allows them to transport oxygen?

- A** contain haemoglobin
- B** large size
- C** surface hairs
- D** thick cell membrane

18. 0653\_s20\_qp\_22 Q: 1

The diagram shows a palisade mesophyll cell from a leaf.

The features of the cell are numbered.



Which features are found only in plant cells?

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

19. 0653\_s20\_qp\_22 Q: 2

Which row about osmosis is correct?

	molecules that move	details of movement	permeability of membrane
<b>A</b>	solute	from a concentrated solution to a dilute solution	fully
<b>B</b>	solute	from a dilute solution to a concentrated solution	partially
<b>C</b>	water	from a concentrated solution to a dilute solution	fully
<b>D</b>	water	from a dilute solution to a concentrated solution	partially

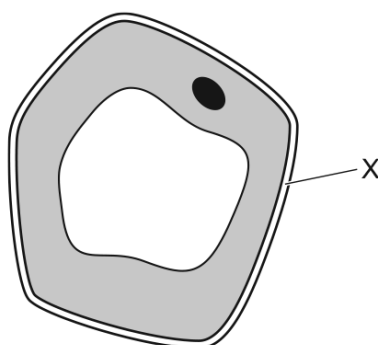
20. 0653\_s20\_qp\_22 Q: 3

Which row matches the adaptation of a root hair cell to its function?

	adaptation	function
<b>A</b>	large surface area	uptake of water and glucose
<b>B</b>	large surface area	uptake of water and ions
<b>C</b>	small surface area	uptake of water and glucose
<b>D</b>	small surface area	uptake of water and ions

21. 0653\_w20\_qp\_21 Q: 1

The diagram shows a cell.



What is the function of X?

- A** contains the genetic information
- B** controls substances entering and leaving the cell
- C** maintains the shape of the cell
- D** photosynthesis

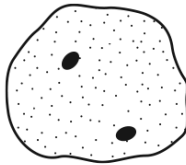
22. 0653\_w20\_qp\_21 Q: 2

What is the function of ciliated cells in the bronchi?

- A absorption of oxygen
- B movement of mucus
- C production of mucus
- D transport of oxygen

23. 0653\_w20\_qp\_22 Q: 1

The diagram shows a cell from an animal's liver.

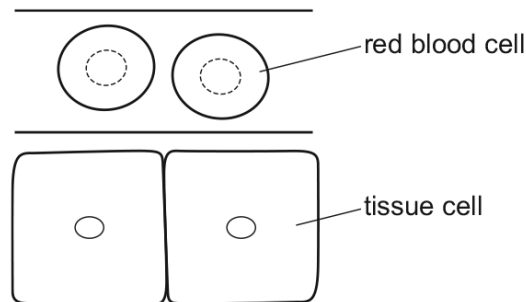


In what way does this cell differ from a typical animal cell?

- A It contains a central vacuole.
- B It contains cytoplasm.
- C It contains two nuclei.
- D It has a cell wall.

24. 0653\_w20\_qp\_23 Q: 1

The diagram shows two red blood cells inside a capillary and two tissue cells near this capillary.



How does the oxygen in the red blood cells reach the tissue cells?

- A by absorption
- B by diffusion
- C by respiration
- D by transpiration

25. 0653\_m19\_qp\_22 Q: 1

The following are features of palisade mesophyll cells:

- 1 column shaped
- 2 have a nucleus
- 3 have large vacuoles
- 4 have many chloroplasts

Which features of these cells help them to absorb maximum light and carry out photosynthesis?

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

---

26. 0653\_s19\_qp\_21 Q: 1

A student is reading a text book. He finds the following definition about how substances move in and out of cells.

The net movement of water molecules from a region of higher water potential to a region of lower water potential through a partially permeable membrane is called

The corner of the page has been torn.

What is the missing word at the end of the sentence?

- A diffusion
- B dissolving
- C evaporation
- D osmosis

27. 0653\_s19\_qp\_22 Q: 1

A student is reading a text book. He finds the following definition about how substances move in and out of cells.

The net movement of water molecules from a region of higher water potential to a region of lower water potential through a partially permeable membrane is called

The corner of the page has been torn.

What is the missing word at the end of the sentence?

- A diffusion
- B dissolving
- C evaporation
- D osmosis

28. 0653\_s19\_qp\_23 Q: 1

Which row has a correct structural adaptation for red blood cells and some of the cells lining the trachea?

	red blood cells	cells lining the trachea
A	nucleus absent	has cilia
B	nucleus present	has cilia
C	nucleus absent	large surface area
D	nucleus present	large surface area



29. 0653\_s19\_qp\_23 Q: 2

A student is reading a text book. He finds the following definition about how substances move in and out of cells.

The net movement of water molecules from a region of higher water potential to a region of lower water potential through a partially permeable membrane is called

The corner of the page has been torn.

What is the missing word at the end of the sentence?

- A diffusion
- B dissolving
- C evaporation
- D osmosis

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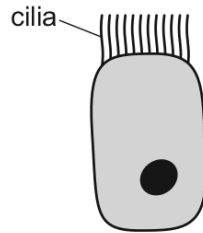
30. 0653\_w19\_qp\_21 Q: 4

How are root hair cells adapted for absorption of water?

- A large surface area
  - B thick cell wall
  - C many chloroplasts
  - D no nucleus
-

31. 0653\_w19\_qp\_23 Q: 2

The diagram shows a ciliated cell.



Which row shows where ciliated cells are found in the human gas exchange system and their correct function?

	location of ciliated cells		function of ciliated cells	
	bronchi	trachea	move mucus away from lungs	move mucus towards lungs
<b>A</b>	✓	✓	✓	✗
<b>B</b>	✓	✓	✗	✓
<b>C</b>	✓	✗	✓	✗
<b>D</b>	✗	✓	✗	✓

### 1.3 Biological molecules

32. 0653\_w19\_qp\_21 Q: 3

1 cm<sup>3</sup> of substance X is added to 10 cm<sup>3</sup> starch suspension and mixed. Food tests are carried out immediately after mixing and again after an hour.

The results of the tests are shown in the table.

test reagent	colour of solution after mixing	colour of solution after one hour
Benedict's solution	blue	orange
iodine solution	blue / black	brown

What is substance X?

- A** amylase
- B** protease
- C** lipase
- D** sugar

# Appendix A

# Answers

SN	Paper	Q. No.	Answer
1	0653_m21_qp_22	1	A
2	0653_w19_qp_21	1	A
3	0653_w19_qp_22	1	A
4	0653_w19_qp_23	1	A
5	0653_m21_qp_22	2	A
6	0653_m21_qp_22	3	C
7	0653_s21_qp_21	1	D
8	0653_s21_qp_21	2	C
9	0653_s21_qp_22	1	D
10	0653_s21_qp_22	2	C
11	0653_s21_qp_23	1	D
12	0653_s21_qp_23	2	C
13	0653_m20_qp_22	1	B
14	0653_s20_qp_21	1	D
15	0653_s20_qp_21	2	B
16	0653_s20_qp_21	5	C
17	0653_s20_qp_21	6	A
18	0653_s20_qp_22	1	C
19	0653_s20_qp_22	2	D
20	0653_s20_qp_22	3	B
21	0653_w20_qp_21	1	C
22	0653_w20_qp_21	2	B
23	0653_w20_qp_22	1	C
24	0653_w20_qp_23	1	B
25	0653_m19_qp_22	1	B
26	0653_s19_qp_21	1	D
27	0653_s19_qp_22	1	D
28	0653_s19_qp_23	1	A
29	0653_s19_qp_23	2	D
30	0653_w19_qp_21	4	A
31	0653_w19_qp_23	2	A
32	0653_w19_qp_21	3	A
33	0653_w19_qp_22	4	A
34	0653_w19_qp_23	4	A
35	0653_m21_qp_22	4	D
36	0653_s21_qp_22	3	B
37	0653_s21_qp_23	3	B
38	0653_m20_qp_22	2	C
39	0653_s20_qp_21	4	B
40	0653_s20_qp_22	4	B
41	0653_w20_qp_21	3	B
42	0653_w20_qp_22	2	B

SN	Paper	Q. No.	Answer
43	0653_w20_qp_23	2	B
44	0653_s19_qp_21	2	B
45	0653_m21_qp_22	5	B
46	0653_s21_qp_21	3	D
47	0653_s21_qp_21	4	C
48	0653_s21_qp_21	13	C
49	0653_s21_qp_22	4	C
50	0653_s21_qp_22	13	C
51	0653_s21_qp_23	4	D
52	0653_s21_qp_23	13	C
53	0653_s20_qp_22	8	B
54	0653_w20_qp_21	4	A
55	0653_m19_qp_22	3	B
56	0653_s19_qp_22	2	C
57	0653_s19_qp_23	7	A
58	0653_w19_qp_21	2	B
59	0653_w19_qp_22	3	B
60	0653_w19_qp_22	8	C
61	0653_w19_qp_23	3	B
62	0653_m21_qp_22	6	C
63	0653_m21_qp_22	7	A
64	0653_s21_qp_21	5	B
65	0653_s21_qp_22	5	D
66	0653_s21_qp_22	6	B
67	0653_s21_qp_23	6	B
68	0653_m20_qp_22	3	B
69	0653_m20_qp_22	4	A
70	0653_s20_qp_21	3	A
71	0653_s20_qp_22	5	B
72	0653_w20_qp_21	5	B
73	0653_w20_qp_21	6	D
74	0653_w20_qp_22	3	C
75	0653_w20_qp_22	4	B
76	0653_w20_qp_23	3	C
77	0653_w20_qp_23	4	A
78	0653_m19_qp_22	2	C
79	0653_m19_qp_22	4	D
80	0653_s19_qp_21	3	D
81	0653_s19_qp_21	4	A
82	0653_s19_qp_22	3	B
83	0653_s19_qp_22	4	A
84	0653_s19_qp_23	3	B