ESSENTIAL

SQA EXAM PRACTICE

NATIONAL 5

BIOLOGY

Practice Questions & Exam Papers

QUESTIONS & PAPERS

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Complete 2 practice papers that mirror the real SQA exams

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Practice Questions

This Key Area index grid will guide you when looking for questions by question type or by Area of Study.

Course areas		Multiple choice	Structured and extended response questions					Check
Area	Key Area		Short answer	Data	Experimental	Extended response	Scientific literacy	
1 Cell biology	1.1	1–2	1	1	1	1	1	$\frac{}{60}$
	1.2	3–4	2					
	1.3	5–6	3			2		
	1.4	7–8	4					
	1.5	9–10	5					
	1.6	11–12	6					
2 Multicellular organisms	2.1	13–14	7	2	2	3	2	$\frac{}{66}$
	2.2	15–16	8					
	2.3	17–18	9			4		
	2.4	19–20	10					
	2.5	21–22	11					
	2.6	23–24	12					
	2.7	25–26	13					
3 Life on Earth	3.1	27–28	14	3	3	5	3	$\frac{}{60}$
	3.2	29–30	15					
	3.3	31–32	16					
	3.4	33–34	17					
	3.5	35–36	18			6		
	3.6	37–38	19					
SSI		39–52						$\frac{}{14}$
Totals		**52**	**76**	**18**	**18**	**21**	**15**	**200**

Practice Paper A

This Key Area index grid will guide you when looking for questions by question type or by Area of Study.

Course areas		Multiple choice	Structured and extended response questions					Check
Area	Key Area		Short answer	Data	Experimental	Extended response	Scientific literacy	
1 Cell biology	1.1	1	1		4		3a	31
	1.2	2, 3, 4, 5						
	1.3	6	3b					
	1.4	7, 8						
	1.5	9						
	1.6	10–13						
2 Multicellular organisms	2.1	14	2, 7	8b, 10a				36
	2.2	15	5, 6					
	2.3	16						
	2.4	17	9					
	2.5		8a					
	2.6	18	10b					
	2.7	19						
3 Life on Earth	3.1	20				12, 16b		33
	3.2	21,22	14					
	3.3		11					
	3.4		13					
	3.5	23	15					
	3.6	24, 25	16a					
Totals		**25**	**52**	**6**	**6**	**7**	**4**	**100**

Practice Paper B

This Key Area index grid will guide you when looking for questions by question type or by Area of Study.

Course areas		Multiple choice	Structured and extended response questions					Check
Area	Key Area		Short answer	Data	Experimental	Extended response	Scientific literacy	
1 Cell biology	1.1	1, 2, 4			5	4		32
	1.2	3	1					
	1.3		2					
	1.4	5, 6, 7	3					
	1.5							
	1.6	8						
2 Multicellular organisms	2.1	9, 10	6	7b, 10a		8		38
	2.2	12, 13	7a					
	2.3							
	2.4	14, 15	9					
	2.5	11	10b					
	2.6	17						
	2.7	16, 18	11					
3 Life on Earth	3.1	19	12, 13		14, 15		16	30
	3.2	20, 24						
	3.3	21, 22						
	3.4	23						
	3.5							
	3.6	25						
Totals		**25**	**42**	**6**	**15**	**7**	**5**	**100**

Question type: Multiple-choice

›› HOW TO ANSWER

In your examination, Section 1 consists entirely of multiple-choice questions. There are 25 questions for 1 mark each. Each question should take about 1.5 minutes and has only **one** correct answer. Section 1 should take approximately 40 minutes to complete. In practice, some questions might take a bit longer, for example, if there is a lot to read or if calculations or genetic crosses are involved. Others can be answered more quickly if they require straightforward recall. The time for these questions is taken up in reading and thinking – there is no writing, only a mark in a grid, although you may need to do some working.

When tackling multiple-choice questions, read the question thoroughly and try to think of the answer without studying the options. Then look at the options:

- If your answer is there, that's the job done.
- If you are not certain of an answer, read through the question again and choose the option that seems the best fit.
- Or, you can try to eliminate options that you are sure are not correct, before making your choice.

Try not to leave any question without an answer marked – complete the grid for each question as you work through.

For these multiple-choice practice questions, you may circle the letter corresponding to your chosen answer, or write your answers on a separate piece of paper.

Top Tip!

In your examination, any rough working for Section 1 should be done on the additional space for answers and rough work, provided at the end of the supplied answer booklet.

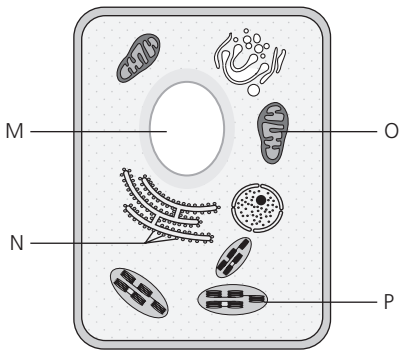
STUDENT MARGIN

Applying KU

1 The diagram represents a plant cell.

Which parts of the cell would also be found in a fungal cell?

A P and N
B P and O
C M, N and O
D M, N, O and P



Demonstrating KU

2 Which row in the table describes the functions of the cell wall and mitochondria in plant cells?

	Function of the cell wall	Function of the mitochondria
A	prevents cell bursting	aerobic respiration
B	controls entry of substances	aerobic respiration
C	prevents cell bursting	protein synthesis
D	controls entry of substances	protein synthesis

Question type: Structured and extended response

Section 2 of your examination is made up of structured and extended response questions for a total of 75 marks. Again, a mark should take about 1.5 minutes, but questions with lots of reading or thinking time or those with calculations or information to process will take longer while some straightforward questions can be done more quickly.

In all cases, you should pay careful attention to the mark allocation and the number of answer lines or space provided. Each individual mark is awarded separately, so if a question is worth 2 marks there will be two parts to the answer required. If several answer lines are provided, you will probably need to use them.

For the practice questions given here, you should write your answers on a separate piece of paper.

The structured questions are of different types: short answer, data handling and experimental, but these will be mixed together in the actual examination paper and there is some overlap.

Top Tip!

Remember, Section 2 of your examination should take no more than 1 hour and 50 minutes.

›› HOW TO ANSWER

Short-answer questions

Most of the short-answer questions in your examination are focused on testing knowledge. They are often introduced by a short sentence about a Key Area and it is very common to have a labelled diagram presented here. There are likely to be 4–5 marks available for related answers. Very occasionally, you may be given a choice of question.

Many of the questions will be at the demand level for Grade C, where you need to name, state or give answers or identify structures. These questions test your memory of the Key Areas (in other words, Demonstrating KU – demonstrating knowledge and understanding).

Some of the questions will be at the demand level for Grade A, which often ask for descriptions, explanations or suggestions. These questions are testing your understanding of Key Areas (in other words, Applying KU – application of knowledge and understanding). There are also likely to be some Skills of Scientific Inquiry (SSI) marks mixed in with these questions.

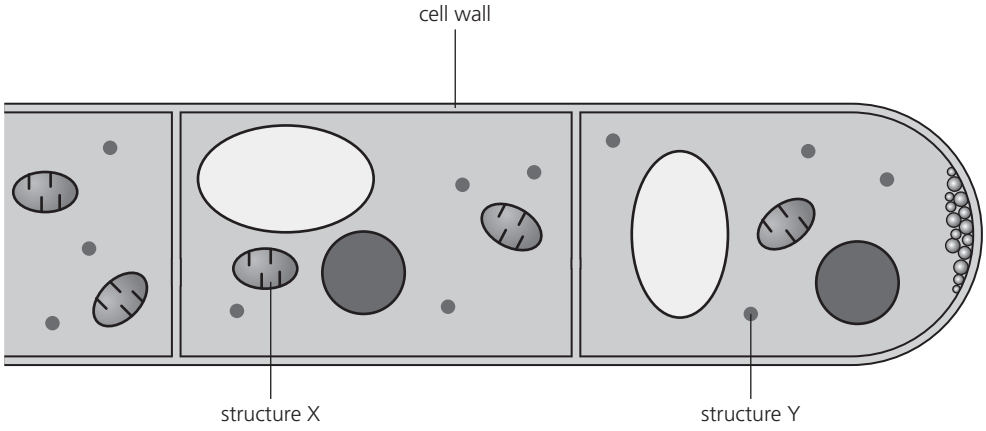
Top Tip!

- Questions that ask for descriptions, explanations or suggestions are often worth multiple marks, so remember to give a statement for each mark.
- 'Explain' questions will always require you to bring in correctly selected additional knowledge. There may be several acceptable answers to 'Suggest' questions.

Make sure you revise your Key Areas thoroughly and systematically. Be aware that the words and terms sought in the answers are those which are given in the Course Specification for N5 Biology – this is crucial.

MARKS | STUDENT MARGIN

1 The diagram shows cells from the tip of a growing soil fungus.



a Complete the table by entering the name of structure X and the process associated with structure Y. — **2** — Applying KU

Structure	Name	Process associated with structure
X		aerobic respiration
Y	ribsome	

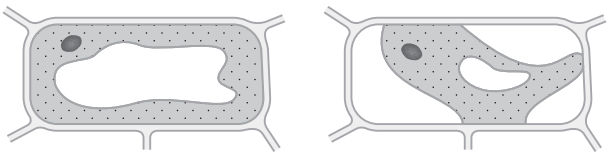
b The fungal cells are different from green plant cells in several ways.

i State how their cell walls differ from those of a green plant cell. — **1** — Demonstrating KU

ii Give **one** other difference between fungal and green plant cells. — **1** — Demonstrating KU

2 Cells from onion tissue were examined under a microscope and then placed in a concentrated sugar solution for 30 minutes.

The diagrams show a cell from the onion before and after being placed in the sugar solution.



a Movement of water caused the change in the appearance of the cell.
Name the process responsible for the movement of water. — **1** — Demonstrating KU

b In terms of water concentration, explain how water movements account for the appearance of the cell after being placed in the sugar solution. — **1** — Applying KU

c Name **one** substance, other than water, which must be able to pass into a cell **and** explain the importance of the substance to the cell. — **1** — Demonstrating KU

d Give **one** difference between active transport and passive transport. — **1** — Demonstrating KU

SECTION 1 – 25 marks

Attempt ALL questions.

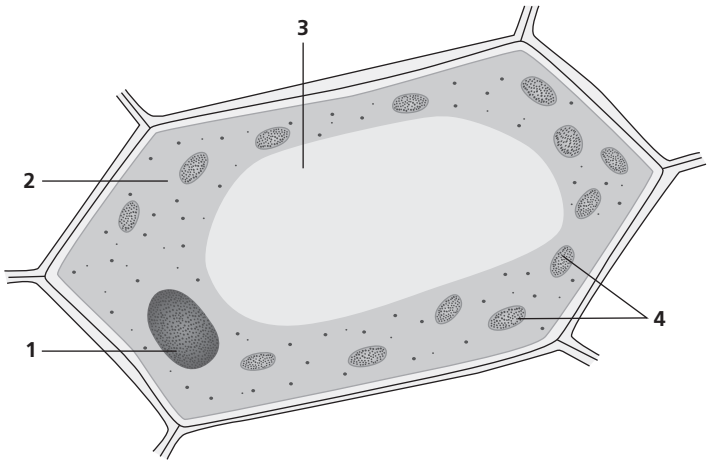
The answer to each question is either A, B, C or D. Decide what your answer is, then circle the appropriate letter.

There is only one correct answer to each question.

Allow yourself 40 minutes for Section 1.

STUDENT MARGIN

1 The diagram shows a plant leaf cell.

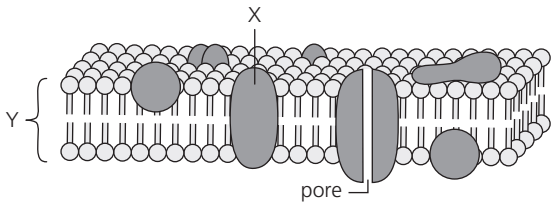


Which row in the table shows the cell structures in which mRNA and sugar are synthesised?

Applying KU

	mRNA	Sugars
A	1	3
B	2	3
C	1	4
D	2	4

2 The diagram shows a magnified view of a cell membrane.



Which row in the table identifies substances X and Y present in the membrane?

Applying KU

	Substance X	Substance Y
A	phospholipid	proteins
B	phospholipid	fatty acids
C	protein	fatty acids
D	protein	phospholipids

SECTION 2 – 75 marks

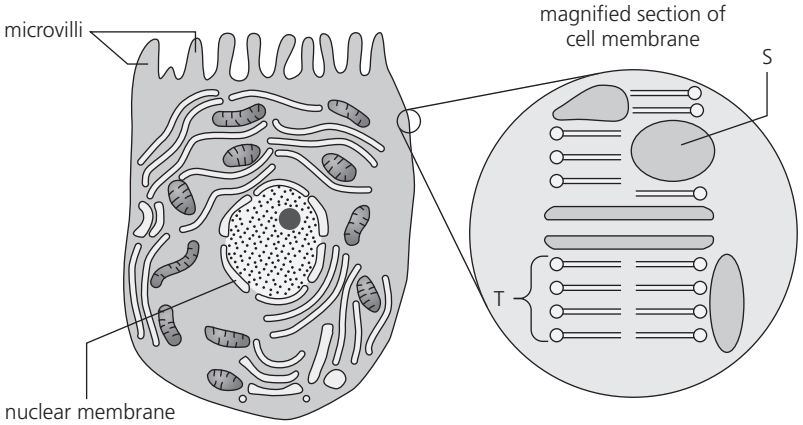
Attempt ALL questions.

Write your answers clearly in the spaces provided. If you need additional space for answers or rough work, please use separate pieces of paper.

Allow yourself 1 hour and 50 minutes for Section 2.

MARKS | STUDENT MARGIN

1 The diagram shows a liver cell and a magnified section of its cell membrane.



a Name the two chemical components of the cell membrane labelled S and T. — **2** — Demonstrating KU

S: _____

T: _____

b Glucose can be taken up by the liver cells by the process of diffusion.

i Describe the process of diffusion. — **1** — Demonstrating KU

_____

_____

ii Explain how the microvilli increase the rate of absorption of glucose into the liver cell. — **1** — Applying KU

_____

_____

c Explain the importance of diffusion to active cells such as liver cells. — **1** — Applying KU

_____

_____

2 a Decide if each of the statements relating to DNA in the table is **true** or **false** and tick (✓) the appropriate box.

If you decide the statement is **false**, write the correct term in the correction box to replace the term underlined in the statement. — **3** — Demonstrating KU

Statement	True	False	Correction
DNA carries the genetic information for making amino acids.			
In DNA, adenine (A) is complementary to thymine (T).			
The synthesis of mRNA takes place in the nucleus.			

Practice Paper A

Section 1

Objective test				
Question	Answer	Mark	Demand	Commentary with hints and tips
1	C	1	C	mRNA is synthesised from DNA codes, which are in the nucleus – structure 1; sugars are made by photosynthesis, which occurs in chloroplasts – structure 4
2	D	1	C	The cell membrane consists of phospholipids and proteins – the phospholipids are numerous and regularly arranged as layers with the proteins scattered
3	D	1	A	Plant tissues that lose water by osmosis shrink and decrease in size (length in this case) – water has moved out of the potato in solution Y so answer D is the only description which would match this
4	A	1	C	Selectively permeable membranes allow small molecules like glucose to pass through but restrict the movement of large molecules such as starch
5	B	1	C	The energy is required to push the molecules against the concentration gradient. In passive transport no extra energy is needed but the movement is always down the gradient
6	B	1	C	The sequence of bases in DNA encodes the sequence of amino acids in protein
7	C	1	C	Although increasing temperature **can** increase enzyme reaction rates, high temperatures may denature the enzymes and so reduce reaction rates; optimum conditions give optimum reaction rates
8	D	1	A	Tricky and needs thought. These proteins have specific shapes so that they bind only with a specific hormone
9	D	1	C	Best tackled by thinking of the flow diagrams used to illustrate the sequence of events; it is essential to learn the vocabulary such as 'required gene' and 'source chromosome' here
10	A	1	C	Aerobic means requiring oxygen; lactate is a product of fermentation, which rules it out
11	D	1	A	Starts at 0.1 and rises to 0.4 so 0.3 cm^3 represents the oxygen consumed in 10 minutes Divide 0.3 cm^3 by 10 to give 0.03 cm^3 in each minute
12	C	1	C	The respiring cells produce CO_2 which must be removed so that changes in the level of liquid on the scale reflect the uptake of oxygen only
13	B	1	C	Yeast can respire aerobically or by fermentation, but ethanol is only produced in the fermentation pathway – the liquid paraffin layer keeps oxygen out and so conditions in tube B are correct for fermentation
14	D	1	C	Stem cells are not gametes so are diploid. They are non-specialised and retain the ability to divide by mitosis to produce more stem cells or to differentiate
15	A	1	A	You must be able to link glycogen with the liver and glucagon with the pancreas and be able to locate these organs on the diagram
16	C	1	C	There are many different flower shapes, but female gametes are always produced in the ovary – C points to an ovule within an ovary
17	B	1	A	The key here is to note that the offspring grains are in a roughly 1 : 1 ratio of purple to yellow, then do the working for each of the options by working out gametes and possible offspring using Punnett squares