

BIOLOGY (US)

Paper 0438/11
Multiple Choice (Core)

<i>Question Number</i>	<i>Key</i>	<i>Question Number</i>	<i>Key</i>
1	D	21	B
2	B	22	B
3	D	23	D
4	B	24	B
5	A	25	D
6	C	26	D
7	A	27	A
8	A	28	C
9	B	29	C
10	B	30	B
11	C	31	C
12	C	32	B
13	C	33	D
14	D	34	D
15	A	35	D
16	B	36	B
17	C	37	D
18	B	38	D
19	C	39	B
20	C	40	A

General comments

Overall the paper proved to be a good test of the candidates' knowledge and ability.

Comments on specific questions

Question 1

Most candidates showed a good understanding of tropic responses.

Question 3

Most candidates were able to use the dichotomous key to correctly identify the species concerned.

Question 5

Many candidates showed a secure knowledge of the structures of the xylem but some were uncertain about the presence or absence of end walls.

Question 15

Although this was a demanding question most candidates were able to correctly apply their knowledge of the function of phloem.

Question 17

Graph interpretation is traditionally a challenging skill to master and this question proved challenging for some. A number of candidates chose the graph that was the reverse of the correct answer.

Question 18

This was a challenging question, but some candidates were able to successfully apply their knowledge of the circulatory system to a novel context.

Question 21

Many candidates recalled the correct concentrations of the constituent gases in expired air. However, some candidates had the misconception that expired air is mainly composed of carbon dioxide.

Question 33

This proved to be the most challenging question on the paper, but it was a standard test of genetics terminology and understanding. Some candidates opted for a cross that would yield a 3:1 ratio, while others may have expected the given ratio to be exactly 1:1 and therefore discounted that option.

Question 38

Some candidates opted for a statement which was scientifically correct but did not answer the question. While it is true that anaerobic respiration in yeast yields alcohol, it is not the reason for its use in bread-making.

BIOLOGY (US)

Paper 0438/21
Multiple Choice (Extended)

<i>Question Number</i>	<i>Key</i>	<i>Question Number</i>	<i>Key</i>
1	D	21	D
2	B	22	A
3	D	23	B
4	B	24	D
5	A	25	B
6	C	26	B
7	B	27	A
8	A	28	C
9	C	29	B
10	B	30	D
11	C	31	A
12	A	32	C
13	C	33	D
14	C	34	C
15	A	35	C
16	B	36	B
17	A	37	C
18	B	38	D
19	B	39	A
20	C	40	A

General comments

Marks were very well spread across the mark range suggesting that all questions fell within the expected capabilities of the candidates taking the paper. A few topics proved challenging for some and they were often topics new to the syllabus.

Comments on specific questions

Question 1

This question provided a welcoming start to the paper with the majority of candidates selecting the correct option.

Question 3

Dichotomous keys were handled competently by nearly all candidates.

Question 5

This question required a quite detailed knowledge of the structure of xylem, which most candidates demonstrated.

Question 9

Many candidates showed a secure knowledge of the limiting factors for photosynthesis and many were able to correctly interpret the graphs.

Question 14

This question was based on one of the new topics (the effects of cholera) in the syllabus and the familiar but challenging topic of water potentials. Some candidates successfully selected the option.

Question 19

There was some confusion over the functioning of the heart valves for some candidates but many were able to select the correct option.

Question 22

There was a misconception among some candidates that an increase in the volume of the thorax produces an increase in pressure in the lungs.

Question 23

Some candidates were able to identify the correct option but many were less sure of how the oxygen debt is removed.

Question 26

That glucagon boosts blood sugar levels was reasonably well known: which organ produces it was less so.

Question 30

Many candidates knew which of the curves on the graph was the correct one for progesterone, but this question proved to be challenging for some.

Question 33

This was a challenging question, for some candidates, on two levels: understanding the terms *hydrophyte* and *xerophyte* and then applying the necessary biological knowledge.

BIOLOGY (US)

Paper 0438/31
Theory (Core)

Key messages

Candidates should endeavour to read questions carefully and specifically address the question asked; targeting answers so that the information presented is limited to what they know to be directly relevant to the question.

Command words such as “describe”, “explain”, “suggest” and “compare” require different responses from candidates. A “suggest” question encourages the candidate to apply their biological knowledge to the situation presented. If a description is required, including a reference to a graph or table, then it will be expected that data will be used in the description given. Many candidates are able to do this effectively. An explanation requires more than just a description and candidates should be encouraged to practise the difference between “explain” and “describe”.

General comments

Candidates appeared to have had sufficient time to complete all sections of the paper.

Comments on specific questions

Section A

Question 1

This question was about classification

- (a) All candidates attempted this question and most demonstrated a good understanding. Although a significant number of candidates did not know that Crustaceans have five pairs of legs.
- (b) Candidates found this question challenging with many not stating what would be needed to calculate actual size or how to use the information in a calculation.
- (c) Most candidates suggested two correct reasons here. The most popular reasons stated were to find food and to avoid predators.
- (d) (i) Many candidates recognised that the crustaceans were both *Porcellana* however, some candidates incorrectly stated that the *Porcellana* was the family or group.
 - (ii) Again, many candidates realised that they were not the same species but some candidates used the wrong term when answering this question.

Question 2

- (a) (i) Many candidates could not adequately define the term sense organ.
- (ii) Many candidates answered this question well and were able to explain that the reason the eye is described as an organ is that it is made of many/more than one tissue working together.
- (b) (i) This question was well answered by some candidates who demonstrated a good knowledge of the structure and functions of the eye, yet it proved challenging for a significant number of candidates.
- (ii) The position of the blind spot was not well known by many candidates.

Question 3

- (a) (i) This calculation was done well by the majority of the candidates.
- (ii) This calculation caused problems for some candidates as they failed to follow instructions to give the answer to one decimal place.
- (b) Better candidates recognised that both hot and dry were the conditions that were needed for the most efficient transpiration.
- (c) (i) Only a small number of candidates performed well here as many candidates described the function of the tissue, and not the adaptation, as was required by the question
- (ii) This question proved challenging for many candidates with only a minority of candidates stating the correct order.
- (d) (i) Fewer candidates than expected knew that water is carried in the xylem.
- (d) (ii) A significant number of candidates demonstrated their knowledge of the xylem and correctly named another substance.

Question 4

- (a) (i) Few candidates could correctly define the term pathogen.
- (ii) Pathogens are transmitted in many ways and most candidates knew at least one of them.
- (iii) This area of the syllabus was not well known with few candidates able to state examples of mechanical and chemical barriers.
- (b) (i) Candidates who performed well here recognised that their answers needed to refer to white blood cells, phagocytosis and the production antibodies. Few candidates gave such comprehensive responses.
- (b) (ii) A significant number of candidates demonstrated their knowledge of modern medicine and correctly named a way in which modern medicine can help the body defend itself.

Question 5

- (a) (i) and (ii) Many candidates interpreted the graph accurately in this question.
- (iii) Many candidates successfully carried out the calculation. Unfortunately, a significant number of candidates forgot to include units with their answer.
- (b) Better candidates provided an explanation to support their suggestion.

- (c) Human activities causing trout numbers to drop were well known, with many candidates providing at least two correct human activities within their answer.
- (d) There were many methods for conserving species that the candidates could have suggested. Most candidates were able to provide at least one correct method.

Question 6

- (a) Many candidates successfully followed the instructions here and were able to demonstrate their knowledge of diffusion and active transport.
- (b) Many candidates performed well here and were able to correctly name organs for each example of diffusion given. A common error was with candidates who gave animal organs for the plant diffusion examples.
- (c) Many candidates correctly stated that plants benefit by a build-up of water because the water provides support.

Question 7

- (a) Very few candidates could correctly define the term mechanical digestion.
- (b)(i) Many candidates successfully identified the pulp, however fewer candidates could label dentine.
 - (ii) Explaining why this tooth is not a canine proved a difficult task for candidates.
 - (iii) Better answers realised the significance of the exposure of the cement when answering this question.
 - (iv) Most candidates gave good descriptions of ways to maintain healthy teeth.

Question 8

- (a)(i) Very few candidates were able to give comprehensive answers to demonstrate that they understood the effect tar has on the body.
 - (ii) Answers to this question showed that the effects of carbon dioxide on limewater was poorly understood.
 - (iii) Many candidates showed that they did not know what universal indicator shows.
 - (iv) Nicotine was a correct answer from many candidates.
- (b) Candidates found this question challenging. Often they could not express themselves well enough to adequately explain what the results showed.
- (c) Only a small number of candidates performed well and showed an appreciation that carbon monoxide found in cigarette smoke prevented oxygen being carried.

Question 9

- (a)(i) – (iv) There was a spread of marks for these questions with a significant number of candidates demonstrating their knowledge and achieving full marks.
- (b) This question was well answered by many candidates.