AQA GCSE Biology | 8461

SPECIFICATION POINT 4.5.2.2

The brain (biology only)

Mark schemes and examiner comments

Tier	**Foundation**
Question groups	**22**
Available paper years	**2007–2024**

Using this booklet

1. Booklet answer numbers match the question booklet.
2. Use the original question number within marking tables.
3. Examiner comments are included where available.

Name: _____ **Date:** _____

Where a precise marking extract is unavailable, the full source document is included in an appendix. Any missing mark scheme is explicitly identified.

4.5.2.2 The brain (biology only)

Answer 01 · Mark scheme

Question 3

	answers	extra information	mark
	A – muscle		1
	B – receptor		1
	C – neurone		1
	D – spinal cord		1
total			4

4.5.2.2 The brain (biology only)

Answer 02 · Mark scheme January 2007 | BLY1F | Original Q4 | Legacy

Question 4

	answers	extra information	mark
(a)	antibodies antitoxins antibiotics		1 1 1
(b)	any **two** from: • measles • mumps • rubella / German measles		2
(c)	less / low / no chance of getting named / all condition(s) if vaccinated quantitative figure(s) e.g. 5 times less likely to get convulsions	must be comparative	1 1
(d)	enzymes genes		1 1
total			9

4.5.2.2 The brain (biology only)

Answer 03 · Mark scheme

Question 6

question	answers	extra information	mark
(a)(i)	bladder		1
(a)(ii)	glucose protein	extras – CANCEL	1 1
(b)(i)	any **two** from: • kidney functions all the time / not just 3 × 8 h sessions a week • can eat high-protein foods / high salt foods • cheaper • waste of time	allow direct quotation of correct points from the list allow can eat anything	2
(b)(ii)	have to take (immunosuppressant) drugs / consequence of this eg catch infections / may suffer brain damage / possible rejection of kidney **or** become ill more easily **or** risk of brain damage (due to anaesthetic)	allow direct quotation of correct points from the list	1
(c)(i)	urea		1
(c)(ii)	4.2		1
total			8

4.5.2.2 The brain (biology only)

Answer 03 · Mark scheme January 2008 | BLY3F | Original Q6 | Legacy

BLY3F

Answer 04 · Mark scheme June 2008 | BLY1AP | Original Q3 | Legacy

Three	**A**	alcohol	**1**
	B	cannabis	**3**
	C	carbon monoxide	**2**
	D	nicotine	**4**

Answer 05 · Mark scheme June 2008 | BLY1BP | Original Q4 | Legacy

Four	**A**	Homo sapiens	**3**
	B	Australopithecus robustus	**4**
	C	Australopithecus afarensis	**1**
	D	Homo habilis	**2**

4.5.2.2 The brain (biology only)

Answer 06 · Mark scheme

June 2008 | BLY1F | Original Q1 | Legacy

question	answers	extra information	mark
1(a)(i)	eye		1
1(a)(ii)	nose		1
1(a)(iii)	skin		1
1(a)(iv)	tongue		1
1(b)	(lung) cancer	accept bronchitis / emphysema / heart disease / blood vessel disease	1
1(c)(i)	eg to ensure more people addicted to cigarettes / make cigarettes more addictive		1
1(c)(ii)	eg people might not buy the brand		1
Total			**7**

4.5.2.2 The brain (biology only)

Answer 06 · Mark scheme June 2008 | BLY1F | Original Q1 | Legacy

COMPONENT NUMBER: BLY1F

COMPONENT NAME: Science B / Biology

STATUS: Final

DATE: June 2008

Answer 07 · Mark scheme March 2009 | BLY1AP | Original Q1 | Legacy

Question	Key		
One	**A**	the skin, which produces sweat	**1**
	B	a lung, which breathes out carbon dioxide	**3**
	C	the brain, which coordinates the other organs	**4**
	D	the kidney, which produces urine	**2**

4.5.2.2 The brain (biology only)

Answer 08 · Mark scheme

June 2009 | BLY1F | Original Q3 | Legacy

Question 3

question	answers	extra information	mark
3(a)(i)	receptor		1
3(a)(ii)	sensory neurone		1
3(a)(iii)	motor neurone		1
3(a)(iv)	muscle		1
3(b)(i)	eye(s)	allow retina ignore sight	1
3(b)(ii)	ear(s)	ignore hearing do **not** allow ear drum	1
3(b)(iii)	ear(s)	ignore balance	1
Total			**7**

4.5.2.2 The brain (biology only)

Answer 08 · Mark scheme

June 2009 | BLY1F | Original Q3 | Legacy

BLY1F

4.5.2.2 The brain (biology only)

Answer 09 · Mark scheme

January 2011 | BLY2F | Original Q2 | Legacy

Question 2

question	answers	extra information	mark
2(a)(i)	lung		1
2(a)(ii)	kidney		1
2(a)(iii)	bladder		1
2(b)(i)	more the same less	allow synonyms	1 1 1
2(b)(ii)	cools / reduces temperature **or** prevent overheating	ignore reference to sweat	1
Total			**7**

4.5.2.2 The brain (biology only)

Answer 09 · Mark scheme

January 2011 | BLY2F | Original Q2 | Legacy

BLY2F

4.5.2.2 The brain (biology only)

Answer 10 · Mark scheme

Question 7

question	answers	extra information	mark
7(a)(i)	brain		1
7(a)(ii)	skin		1
7(a)(iii)	1/25 **or** 4% **or** 0.04 **or** 1 in 25 **or** 1:25 **or** 1 out of 25	allow $\frac{1000}{25000}$	1
7(b)	any **two** from: • increased / high heart rate / pulse rate • dilation / widening of <u>arteries / arterioles</u> (to skeletal muscles) **or** less blood flow to other organs • increased stroke volume / described	do **not** allow pumps more blood unqualified accept vasodilation unqualified do **not** accept reference to veins / capillaries	2
7(c)	<u>more</u> respiration / description **or** <u>more</u> energy required **or** to provide <u>more</u> energy	ignore references to breathing	1
	respiration / process described → CO_2	do **not** accept anaerobic respiration	1
	CO_2 <u>diffuses</u> into blood		1
Total			**8**

4.5.2.2 The brain (biology only)

Answer 10 · Mark scheme

January 2011 | BLY3F | Original Q7 | Legacy

BLY3F

4.5.2.2 The brain (biology only)

Answer 11 · Mark scheme

June 2011 | BLY1F | Original Q5 | Legacy

Question 5

question	answers	extra information	mark
5(a)	a drug taken for pleasure / fun	allow not taken as medicine ignore recreational / legal / harmless / specific effects on body	1
5(b)(i)	45		1
5(b)(ii)	a cup of takeaway coffee		1
5(c)	There is a link between drinking caffeine and hallucinations.	extra boxes ticked cancels the mark	1
Total			**4**

4.5.2.2 The brain (biology only)

Answer 11 · Mark scheme

June 2011 | BLY1F | Original Q5 | Legacy

BLY1F

4.5.2.2 The brain (biology only)

Answer 12 · Mark scheme

January 2012 | BL1FP | Original Q6 | Legacy

Question 6

question	answers	extra information	mark
6(a)(i)	addictive	allow addicting / addict / addicted / addiction or similar allow phonetic spelling do **not** accept **/** additive / addition	1
6(a)(ii)	junction / gap / space between neurones	allow nerve cells / nerves for neurones allow idea where neurones / nerve cells / nerves meet / join	1
6(b)(i)	tablet with no drug	accept answers that convey this idea eg fake / dummy / sugar pill allow injection with no drug ignore drugs that don't work.	1
6(b)(ii)	for comparison	accept to see if drug / it works allow to see psychological effect **or** make sure, it is not all in the mind allow as a control ignore 'to make test fair / unbiased'	1
6(b)(iii)	Neither doctors nor volunteers		1

Question 6 continues on the next page . . .

BL1FP

Question 6 continued

question	answers	extra information	mark
6(b)(iv)	any **two** from: • age (range) • sex / gender (mix) • previous smoking habits **or** eg number smoked (before trial) **or** length of time smoked • number in the group • other drugs being taken **or** general health **or** height / weight / BMI / lifestyle / fitness	ignore factors already controlled ignore reference to all smokers **or** all want to give up	2
6(c)	higher percentage / number of smokers who had stopped smoking (than Drug B)	answers must refer to data and be comparative allow best results / most effective ignore best drug unqualified ignore references to 12 weeks / 1 year	1
Total			**8**

4.5.2.2 The brain (biology only)

Answer 12 · Mark scheme

January 2012 | BL1FP | Original Q6 | Legacy

BL1FP

4.5.2.2 The brain (biology only)

Answer 13 · Mark scheme

January 2013 | BL2FP | Original Q6 | Legacy

Question 6

question	answers	extra information	mark
6(a)	any **two** from: • constant speed • constant effort • constant temperature	**or** allow converse for outdoors • variable speed • variable terrain • traffic conditions • variable temperature • wind (resistance) • rain / snow } allow weather allow pollution only if qualified by effect on body function but ignore pollution unqualified if no other marks obtained allow variable conditions outdoors	2
6(b)	Brain		1
6(c)(i)	20 800	correct answer with or without working gains **2** marks if answer incorrect, allow **1** mark for use of 1200 and 22 000 only	2
6(c)(ii)	oxygen glucose / sugar	apply list principle do **not** accept other named substances eg CO_2 water allow glycogen ignore food / carbohydrate	1 1
6(c)(iii)	respire aerobically		1
6(c)(iv)	carbon dioxide lactic acid		1 1
6(d)	increased heart rate	ignore adrenaline / drugs accept heart beats more but not heart pumps more	1
Total			**11**

4.5.2.2 The brain (biology only)

Answer 13 · Mark scheme

January 2013 | BL2FP | Original Q6 | Legacy

BL2FP

4.5.2.2 The brain (biology only)

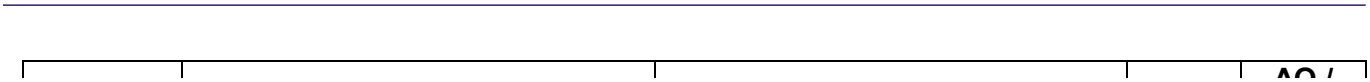
Answer 14 · Mark scheme June 2014 | BL1FP | Original Q6 | Legacy

Question	Answers	Extra information	Mark	AO / spec ref.
6(a)(i)	(volume) increases (with time)	ignore numbers	1	AO2 1.8.1
6(a)(ii)	there is more evidence / specimens / results (for Homo sapiens)	allow examples of this, eg more / better fossils allow converse if clearly referring to Australopithecus ignore reference to being 'more recent'	1	AO3 1.8.1
6(b)	2.5 – 3.15 (million years ago)	accept any number in range	1	AO3 1.8.1
6(c)(i)	Darwin		1	AO1 1.8.1a
6(c)(ii)	any **one** from: • they believed in other theories • insufficient evidence • no proof • genes / mechanism of inheritance not known / discovered	allow they believe that God made all life ignore 'no evidence' allow not enough proof	1	AO1 1.8.1b
Total			**5**	

4.5.2.2 The brain (biology only)

Answer 14 · Mark scheme

June 2014 | BL1FP | Original Q6 | Legacy



4.5.2.2 The brain (biology only)

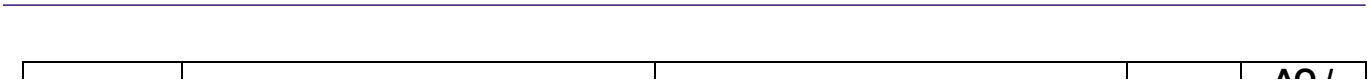
Answer 15 · Mark scheme

Question	Answers	Extra information	Mark	AO / spec ref.
2(a)	brain blood sweat	in correct order only	1 1 1	AO1 3.3.2a, b,c
2(b)(i)	A		1	AO3 3.1.1e
2(b)(ii)	to replace ions lost (in sweat)	accept salts allow named examples, eg. prevent cramps	1	AO1 3.1.1e
2(b)(iii)	any **one** from: • there is too much glucose / sugar in the sports drink • they shouldn't have too much glucose / blood sugar • it would cause their blood glucose / sugar to rise (too high)		1	AO2 3.1.1d, 3.3.3d
Total			6	

4.5.2.2 The brain (biology only)

Answer 15 · Mark scheme

June 2014 | BL3FP | Original Q2 | Legacy



4.5.2.2 The brain (biology only)

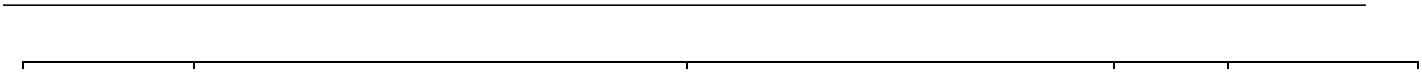
Answer 16 · Mark scheme June 2016 | BL1FP | Original Q7 | Legacy

Question	Answers	Extra information	Mark	AO / Spec. Ref.
7(a)(i)	legal, recreational drugs		1	AO1 1.3.1e
7(a)(ii)	any **one** from: • dependence / addiction • withdrawal (symptoms) or described	 allow reliance eg headache / sickness / nausea ignore side effects alone	1	AO1 1.3.1h
7(b)(i)	idea of not part of the drug company **or** it is another company	not biased can be accepted for either part bi or bii, but not both	1	AO2 1.3.1a
7(b)(ii)	idea of so they will not be biased	allow results will be trustworthy	1	AO3 1.3.1a
7(b)(iii)	no / reduced feeling of pleasure from alcohol (so) less likely to drink alcohol	allow brain less sensitive to alcohol allow so easier to stop (drinking alcohol)	1 1	AO3 1.3.1
7(c)(i)	higher % **or** more boys (than girls) drink beer / lager / cider higher % **or** more girls (than boys) drink spirits / alcopops / wine	allow boys drink more beer / lager / cider allow girls drink more spirits / alcopops / wine allow valid descriptions using % figures	1 1	AO2 1.3.1
7(c)(ii)	any **one** from: • only 100 boys were surveyed • only done on 15-year-olds • no data on the table about boys that don't drink alcohol • data only about UK • boys may have lied about alcohol consumption	 allow small sample may not be representative allow not done on all ages allow none of the bars are 100% or highest bar is 88%	1	AO3 1.3.1
Total			**9**	

4.5.2.2 The brain (biology only)

Answer 16 · Mark scheme

June 2016 | BL1FP | Original Q7 | Legacy



4.5.2.2 The brain (biology only)

Answer 17 · Mark scheme November 2020 | 8461/2F | Original Q5

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.1	(A) cerebellum (B) pituitary gland (C) cerebral cortex		1 1 1	AO1 4.5.2.2 AO1 4.5.3.1 AO1 4.5.2.2
05.2	cerebellum		1	AO1 4.5.2.2
05.3	coordinator		1	AO1 4.5.1 4.5.2.1
05.4	neurone	allow nerve (cell) ignore names of neurone	1	AO1 4.5.2.1
05.5	retina		1	AO1 4.5.2.3
05.6	can see fruit / food (so) get more food	allow can find fruit / food	1 1	AO2 4.5.2.3 4.7.1.4
05.7	accommodation		1	AO1 4.5.2.3
05.8	light rays are refracted less		1	AO1 4.5.2.3
05.9	any **one** from: • myopia • short-sightedness	allow near-sightedness	1	AO1 4.5.2.3
Total			**12**	

4.5.2.2 The brain (biology only)

Answer 17 · Mark scheme

November 2020 | 8461/2F | Original Q5

4.5.2.2 The brain (biology only)

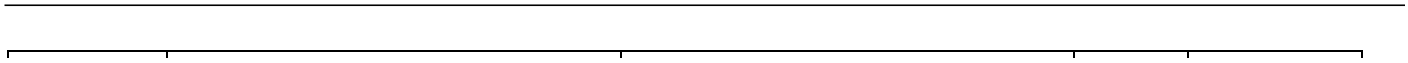
Answer 18 · Mark scheme November 2021 | 8461/2F | Original Q4

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.1	A = cornea B = lens C = optic nerve		1 1 1	AO1 4.5.2.3
04.2	by becoming thicker		1	AO1 4.5.2.3
04.3	ciliary muscles suspensory ligaments		1 1	AO1 4.5.2.3
04.4	retina	allow rods / cones / fovea	1	AO1 4.5.2.3
04.5	retina brain muscles	in this order only 3 correct = **2** marks 1 or 2 correct = **1** mark	2	AO2 4.5.2.1
Total			**9**	

4.5.2.2 The brain (biology only)

Answer 18 · Mark scheme

November 2021 | 8461/2F | Original Q4



4.5.2.2 The brain (biology only)

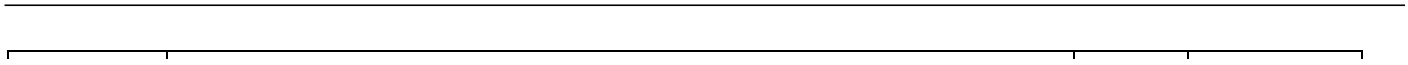
Answer 19 · Mark scheme November 2021 | 8461/2F | Original Q10

Question	Answers	Extra information	Mark	AO / Spec. Ref.
10.1	any **one** from: • movement would release (extra) heat • movement would increase body temperature • movement would increase sweating		1	AO2 4.5.1 4.5.2.4
10.2	37.4 °C		1	AO2 4.5.1 4.5.2.4
10.3	<u>blood</u> is cooled at stomach / mouth (cooled) blood flows to the brain		1 1	AO2 4.5.1 4.5.2.4
10.4	via nerve(s) / neurones **or** via (nerve) impulse(s)	ignore type of neurone allow electrical signals allow via the nervous system	1	AO2 4.5.1 4.5.2.4
10.5	less sweating occurs so less heat is lost **or** less cooling	allow less sweat evaporates do **not** accept no sweating allow less heat used for evaporation of sweat / water	1 1	AO3 AO2 4.5.1 4.5.2.4
10.6	dilation of blood vessels in the skin		1	AO2 4.5.1 4.5.2.4
Total			**8**	

4.5.2.2 The brain (biology only)

Answer 19 · Mark scheme

November 2021 | 8461/2F | Original Q10



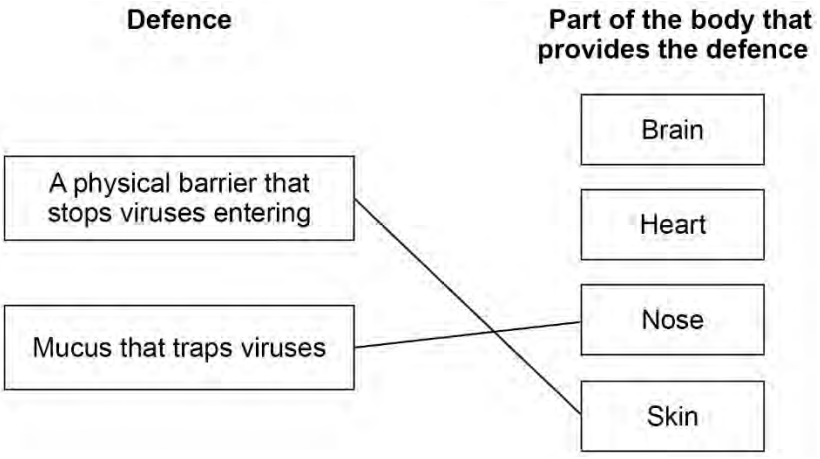
4.5.2.2 The brain (biology only)

Answer 20 · Mark scheme

June 2023 | 8461/1F | Original Q2

Question 2

Question	Answers	Extra information	Mark	AO / Spec Ref.
02.1	pathogens		1	AO1 4.3.1.1

Question	Answers	Mark	AO / Spec Ref.
02.2	 do **not** accept more than one line from a box on the left	1 1	AO1 4.3.1.6

Question	Answers	Extra information	Mark	AO / Spec Ref.
02.3	division		1	AO1 4.2.2.7

Question	Answers	Extra information	Mark	AO / Spec Ref.
02.4	malignant tumours have cells that can spread to other parts of the body malignant tumours may form secondary tumours		1 1	AO1 4.2.2.7

Question	Answers	Extra information	Mark	AO / Spec Ref.
02.5	(percentage) decreases		1	AO3 4.2.2.7 4.2.2.5

Question	Answers	Extra information	Mark	AO / Spec Ref.
02.6	more females were vaccinated (over time)	allow males may also be vaccinated allow more people were vaccinated allow increased use of (named) barrier methods of contraception allow more awareness / education (about HPV)	1	AO3 4.2.2.7 4.2.2.5

Question	Answers	Extra information	Mark	AO / Spec Ref.
02.7	white blood cells		1	AO1 4.3.1.7

Question	Answers	Extra information	Mark	AO / Spec Ref.
02.8	antibodies		1	AO1 4.3.1.7 4.3.1.6

Question	Answers	Extra information	Mark	AO / Spec Ref.
02.9	any **one** from: • people are afraid of side / unknown effects • religious / cultural objections • (some people) believe they don't work • some people think (HPV) vaccine encourages sexual activity	ignore pain of injection allow there are side effects allow people think they cause (named) disease ignore religion unqualified ignore moral / ethical objections	1	AO3 4.3.1.7

Total Question 2	11

4.5.2.2 The brain (biology only)

Answer 21 · Mark scheme

June 2024 | 8461/2F | Original Q1

Question 1

Question	Answers	Mark	AO / Spec Ref.
01.1	(stimulus) → receptor → coordinator → effector → (response) allow receptor → coordinator for **1** mark allow coordinator → effector for **1** mark	2	AO1 4.5.2.1

Question	Answers	Extra information	Mark	AO / Spec Ref.
01.2	any **two** from: • fast / rapid • a response / reaction • automatic / involuntary **or** not under conscious control • protects (from danger / harm)	 ignore action allow not coordinated by the conscious part of the brain **or** allow does not involve thought / thinking ignore not coordinated by the brain	2	AO1 4.5.2.1

Question	Answers	Extra information	Mark	AO / Spec Ref.
01.3	blinking in sudden bright light		1	AO2 4.5.2.1

Question	Answers	Extra information	Mark	AO / Spec Ref.
01.4	muscle		1	AO1 4.5.2.1

Question	Answers	Extra information	Mark	AO / Spec Ref.
01.5	B		1	AO1 4.5.3.1

4.5.2.2 The brain (biology only)

Answer 21 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec Ref.
01.6	A		1	AO1 4.5.2.2

Question	Answers	Extra information	Mark	AO / Spec Ref.
01.7	balance		1	AO1 4.5.2.2

Total Question 1	9

4.5.2.2 The brain (biology only)

Answer 22 · Mark scheme

June 2024 | 8461/2F | Original Q4

Question 4

Question	Answers	Extra information	Mark	AO / Spec Ref.
04.1	(A) optic nerve (B) lens		1 1	AO1 4.5.2.3

Question	Answers	Extra information	Mark	AO / Spec Ref.
04.2	contract		1	AO1 4.5.2.3

Question	Answers	Extra information	Mark	AO / Spec Ref.
04.3	thicker		1	AO1 4.5.2.3

Question	Answers	Extra information	Mark	AO / Spec Ref.
04.4	iris		1	AO1 4.5.2.3

Question	Answers	Extra information	Mark	AO / Spec Ref.
04.5	any **one** from: • (sent as) impulses • along sensory neurone(s)	allow (sent as) electrical signals ignore messages	1	AO1 4.5.2.1 4.5.2.3

Question	Answers	Extra information	Mark	AO / Spec Ref.
04.6	the light rays do not meet / focus / converge on the retina	allow the light rays meet / focus / converge before the retina allow the light rays do not meet / focus / converge at the back of the eye allow lens is too thick allow eyeball is too long	1	AO3 4.5.2.3

4.5.2.2 The brain (biology only)

Answer 22 · Mark scheme

June 2024 | 8461/2F | Original Q4

Question	Answers	Extra information	Mark	AO / Spec Ref.
04.7	any **one** from: • (hard / soft) contact lenses • (laser) surgery • replacement lens (in the eye)	ignore spectacles / glasses	1	AO1 4.5.2.3

Total Question 4	8

4.5.2.2 The brain (biology only)

Answer 17 · Examiner comments

November 2020 | 8461/2F | Original Q5

Question 5 (low & standard demand)

This question was about the brain and vision. In **05.6**, whilst many students realised that being able to detect UV light would enable a bird to feed, very few went on to explain that this would mean they would get more food (than their competitors). Some students suggested that this ability would enable the birds to detect predators, although there was no information that would lead them to this conclusion. Whilst others thought that only rotten fruit would reflect UV light, so being able to detect this would prevent them eating such fruit. **05.8** was not answered well, with the correct response, 'light rays are refracted less' when looking at a distant object being by far the least commonly chosen answer. More light being reflected was the preference of nearly half of the students.

4.5.2.2 The brain (biology only)

Answer 20 · Examiner comments

June 2023 | 8461/1F | Original Q2

Question 2 (Low demand)

02.1 Nearly all students were able to determine 'pathogens' as being the name given to microorganisms that cause disease.

02.2 Almost 90% of students correctly linked both defences to the part of the body that provided the defence. Students should be reminded that they must not draw more than one line from a box on the left in these questions, as this will not gain credit.

02.3 A pleasing 90% of students knew that a tumour can form when changes to cells cause uncontrolled cell division**.**

02.4 Students have a clear understanding of features of malignant tumours, and indeed only around 4% of students gained zero marks on this question. Almost two thirds of students gained both available marks.

02.5 Over 95% of students gained this mark. A number went on to use data in support of their statements but this was not necessary. Some simply said that Table 2 showed that 'the vaccine had worked', but as the question asked specifically about how the **percentage** of females with HPV had changed, no credit could be given.

02.6 Surprisingly, only around 42% of students could suggest a correct reason for the change in HPV cases from 2010-2016. Many of these students correctly referred to more females, and sometimes more males as well, being vaccinated. Those failing to gain credit however, often simply stated 'vaccination' as the reason but gave no idea as to why the percentage continued to fall over time.

02.7 Nearly 80% of students knew that white blood cells respond to an inactive virus, and gained the mark.

02.8 While the most common incorrect answer was 'antibiotics', it was pleasing to see over 93% of students correctly identifying antibodies as being produced in response to the inactive virus.

02.9 Most credited responses here were around concerns of side effects from the vaccine and this was expressed in many different ways. Around 60% were in fact successful in gaining the mark. Reference to 'anti-vax' parents was seen but unless qualified as to the reason behind refusal to vaccinate it failed to gain a mark. Many students correctly quoted religious or cultural objections although, 'religion' or 'beliefs' on their own were insufficient. The idea that the vaccine might simply not work was commonly credited but answers such as 'parents are scared of the vaccine' or 'it's too expensive' gained no marks.

4.5.2.2 The brain (biology only)

Answer 21 · Examiner comments June 2024 | 8461/2F | Original Q1

Question 1 (low demand)

01.1 Over 50% of students correctly completed the order of structures and gained two marks.

01.2 Almost 80% of students gained credit in this question, with the majority gaining full credit with very simple statements such as 'a fast reaction'. A common reason for not gaining credit was by giving an example of a reflex action rather than defining it.

01.3 95% of students knew that blinking in sudden bright light is an example of a reflex action.

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Answer 21 · Examiner comments June 2024 | 8461/2F | Original Q1

01.4 Almost 95% of students knew that muscle is the type of tissue that causes movement.

01.5 Around two thirds of students correctly identified the pituitary gland.

01.6 Half of students correctly identified the cerebral cortex.

01.7 Almost 65% of students knew that balance is the function of the cerebellum.

4.5.2.2 The brain (biology only)

Answer 22 · Examiner comments

June 2024 | 8461/2F | Original Q4

Question 4 (low and standard demand)

04.1 Over half of students correctly labelled both the optic nerve and the lens, with a further 40% labelling at least one of them correctly for a mark.

04.2 60% of students knew that to focus on a near object the ciliary muscles contract.

04.3 Just under 50% of students knew that the lens becomes thicker to focus on a near object.

04.4 One third of students knew that the size of the pupil is controlled by the iris, with the most common wrong answer being suspensory ligaments.

04.5 15% of students were able to achieve this mark, with many falling short by using poor terminology such as 'messages' or referring to 'signals' unqualified.

04.6 A little over 10% of students were able to articulate themselves clearly enough to gain the mark. All of the different options on the mark scheme were seen with some good descriptions given as to why the image would not be clear. Many students stated that the light rays had crossed without specifying where this has happened and fell short of the mark. Other students talked about the light rays not meeting, but at the wrong part of the eye such as the sclera or optic nerve so again did not gain the mark.

04.7 A well answered question with 75% of students gaining credit, mostly for referring to either 'laser eye surgery' (or simply just 'surgery') or to contact lenses.

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