

Examiners' Report June 2022

International GCSE Biology 4BI1 2BR



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Introduction

The new qualification was examined in June 2022 for the second time in a full summer series. The examiners were impressed with the standard of student responses. Centres have prepared students well for the new style of questions and the new areas of specification content. Generally, despite the interruption and disruptions to student learning, most students were able to demonstrate very good levels of knowledge and understanding of the specification content. There was no evidence of students running out of time on the paper and most students attempted all questions.

Students did better than in previous series on the longer prose items which used the command word 'comment'. Students also did well on applying their knowledge to novel scenarios including those describing practical experiments. Most students did well on the items examining the mathematical skills outlined in the appendix at the end of the specification. In the calculations most students showed their working so that even if they did not get the final answer they were able to gain some credit.

Question 1 (a)

Question 1 provided students with a passage about human kidney disease and the possible treatments.

In item 1(a) students were asked to give one way that a person can change their diet to lower their risk of developing high cholesterol. Almost all students were able to gain one mark by stating that the consumption of less lipid would reduce the risk of developing high cholesterol.

(a) Give one way that a person can change their diet to lower their risk of developing high cholesterol (lines 4 to 6).

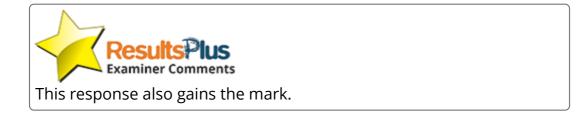
(1)Eat less fat, eat more heathy food like vegetables, reduce - Fat in diet.



(a) Give one way that a person can change their diet to lower their risk of developing high cholesterol (lines 4 to 6).

(1)

Intake less food containing fat



Question 1 (b)

See below.

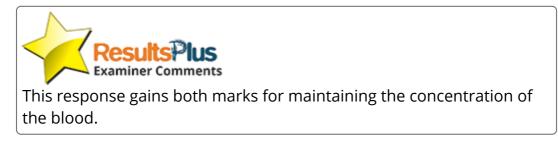
(b) One function of the kidney is excretion (line 9). Another function is osmoregulation.

Explain what is meant by the term osmoregulation.

(2)

the process of maintaining a su	itable concentration of
the blood by increasing /decreasing	
the blood by increasing /decreasing	a readour ption of water. 7
The Mark anti-divertic harmone is	responsible for asmoregulation.
	in the collecting duct

osmore gulation aids in adequately hydrating the body.



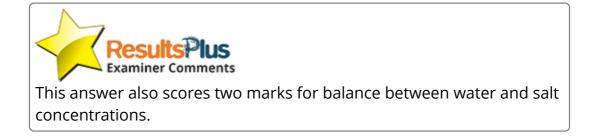
(b) One function of the kidney is excretion (line 9). Another function is osmoregulation.

Explain what is meant by the term osmoregulation.

(2)

maintaining		
Howing	- Osmobic balance between water and s	soAt.

concentrations



Question 1 (c)

In item 1(c) students were asked to explain why a person with severe kidney disease will need dialysis to continue for life. Only the best answers gained both marks for explaining that urea or metabolic waste needs to be excreted from the body to prevent it accumulating. They also explained that this is incurable and must continue unless a transplant takes place.

(c) Explain why a person with severe kidney disease will need dialysis to continue for life (lines 15 to 16).

Severe kidney failure, they person has be able toxic notobollic w properly excrete heir body. A dialysis will allow ham filter out 0 "clean" Wask and pump back notabollic bod a regular occasion in a normal iltenm 6000 3 must be done regularly bodu to avoid complications. Des 1 dialysis

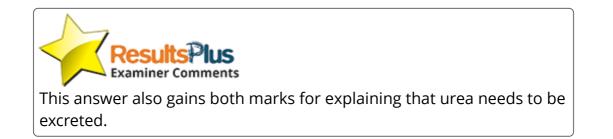


(2)

(c) Explain why a person with severe kidney disease will need dialysis to continue for life (lines 15 to 16).

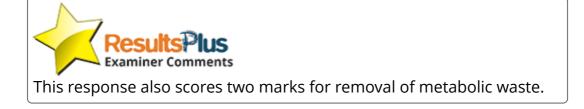
(2) ' ' '

Plalysis is required because otherwise urea, excess water and ions cannot be excreted and will build up to harm ful levels in the Osmoregulation would also not be possible / they cannot regulate the Water content in their blood



(c) Explain why a person with severe kidney disease will need dialysis to continue for life (lines 15 to 16).

(2)dialusis 13 Cychey Mean to the nnea and have a a lot waste Undean into dialycis id fluid Nomen. his solution remove refutohic haste The Nater fer Mat Can



Question 1 (d)(i)

This item asked students to explain what is meant by a partially permeable membrane. Most responses scored at least one mark and the best responses explained that a partially permeable membrane only lets through small molecules.

- (d) The peritoneum acts as a partially permeable membrane.
 - (i) Explain what is meant by a partially permeable membrane (lines 23 to 24).

(2)

(2)A partially permette permette membrane is a membrane Cumilly sacratly way party for substances such as quese.



- (d) The peritoneum acts as a partially permeable membrane.
 - (i) Explain what is meant by a partially permeable membrane (lines 23 to 24).

(2)membrane that is selectively permeaable to specific substance, that only some molecule could diffuse through that membrane



This response scores one mark for explaining that the membrane only allows some molecules to enter.



To gain the second mark the response would need to refer to only small molecules can pass through, or the membrane not allowing large molecules to pass through.

Question 1 (d)(ii)

In item1(d)(ii) students needed to explain why the dialysis solution must contain purified water, glucose and mineral ions. Some gained one mark but only the best answers explained that the solution contains glucose and ions so that they do not leave the blood or so that they can diffuse into the blood, as glucose is required for respiration.

 Explain why the dialysis solution must contain purified water, glucose and mineral ions (lines 19 to 21).

(2)the viste mas d

This scores both marks for explaining that glucose is prevented from diffusing out of the blood.

(ii) Explain why the dialysis solution must contain purified water, glucose and mineral ions (lines 19 to 21).

(2)

Fine the I'l we pro It help maintain a name concercitation of a preched t wreful substances the the provent a concentration gradion . of of more and mineral ions to diffure out , prevent of useful untrient like hator, gluese and mineral low. The useful substances like water with stay in blood as no concentration anadient Examiner Comments

This gains both marks for explaining that a concentration gradient prevents glucose diffusing out of the blood.

Question 1 (e)

This asked students to explain how the composition of the dialysis solution results in the waste products being removed from the blood. Students gained marks for explaining that a lower concentration of waste products such as urea would mean that it diffuses out of the blood into the solution.

(e) Explain how the composition of the dialysis solution results in the waste products being removed from the blood (lines 21 to 22).

a higher concentration of waste in the blood products a cus compared to the dialycis solution, the waste products can be removed from me blood. This is because of osmors and diffuin where particles more from as area of high to low concentration and in someries, water particles more from an area of high to law water potential across a semi remeable menbrane



Lower concentration in the dialysis solution means that the waste products can diffuse out of blood.

(2)

(e) Explain how the composition of the dialysis solution results in the waste products being removed from the blood (lines 21 to 22).

(2)

· There is a low concentration of waste products in the

dialy sis solution

·urea, salt and other metabolio waste diffuse from anigh concentration in the boay to a low concentration into the dialysis solution across a semi-permeable. membranel.



This response also scores both marks for explaining a lower concentration of urea means that it diffuses from the blood into the dialysis solution.

Question 1 (f)(i)

See below.

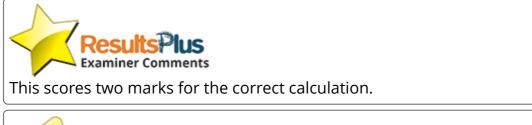
(f) (i) A person is using APD.

Calculate the percentage of their time used for treatment in a week (lines 33 to 35).

9 hours and day 24 9 x100 = 37.5

percentage = 37.5 %

(2)





This student realised that the percentage of time each day is the same as the percentage time over a week. This made their calculation simpler.

(f) (i) A person is using APD.

Calculate the percentage of their time used for treatment in a week (lines 33 to 35).

9 parchay 9×7= 63 hours $\frac{63}{168} = 0.375$ 7×24 168 375 percentage = % Examiner Comments This student also got both marks for the correct percentage. **Results**Plus **Examiner Tip** However there is no need to multiply the 9 or the 24 by seven as the

(2)

percentage per day is the same as the percentage per week.

Question 1 (f)(ii)

Almost all students could suggest why people may prefer to use CAPD instead of haemodialysis. Suitable answers included freedom to walk about and not requiring a machine or a visit to hospital.

Question 1 (g)

In this item students were asked to describe how the structures in a human kidney result in the correct substances being retained in the blood. Many students gained full credit for describing how large molecules such as proteins are unable to pass from the glomerulus into the Bowman's capsule so stay in the blood. They also described how glucose is reabsorbed in the proximal convoluted tubule and how water is reabsorbed in the collecting duct.

(g) Describe how the structures in a human kidney result in the correct substances being retained in the blood.

(3)A human hidney is made up at nephrons which perform ultrafil tration at the domendus unequiciter, salts and glucose are dood. torud sman's capsule presure to high blood phonoh SI1 6600 to be taken out the e proximal convolute Im sals That man need CONIACO



This response gains three marks for glucose being reabsorbed in the proximal convoluted tubule and water being reabsorbed in the collecting duct.

Question 2 (a)

In item 2(a) almost all students could calculate the increase in water temperature, the energy released in joules by the third sample. And most could also calculate the energy released in joules by 1g.

The table shows some of the student's results.

Initial temperature of water in °C	Final temperature of water in °C	Increase in water temperature in °C	Energy released in J	Mass of bread sample in g	Energy released by 1 g of bread in J
20	33	13	1092	0.25	4368
20	34	14	1176	0.30	3920
21	36	15	1260	0.20	

(a) To calculate the energy released from the burning bread the student uses this formula.

energy (in J) = mass of water (in g) \times 4.2 \times increase in temperature (in °C)

They then calculate the energy in joules released by 1 g of bread.

(i) Calculate the increase in water temperature for the third sample of bread.

$$22 \times 4.2 \times (36 \times 1)$$
(1)

$$23 \times 4.2 \times (36 \times 1)$$
(1)

$$36 - 21 = 15$$
 temperature increase = 2660 15 °C
ii) Calculate the energy released in joules by the third sample of bread.
[1 cm³ of water has a mass of 1 g]

$$20 \times 4.2 \times (5$$
(1)

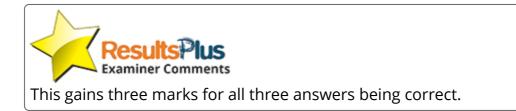
(iii) Calculate the energy released in joules by 1g of bread for the third sample of bread.

$$0.20 \times 5 = 1$$

$$1260 \times 5 = 6300$$

$$= 6300$$
energy released by 1g = 6300

(ii)



The table shows some of the student's results.

Initial temperature of water in °C	Final temperature of water in °C	Increase in water temperature in °C	Energy released in J	Mass of bread sample in g	Energy released by 1 g of bread in J
20	33	13	1092	0.25	4368
20	34	14	1176	0.30	3920
21	36	15	1260	0.20	6300

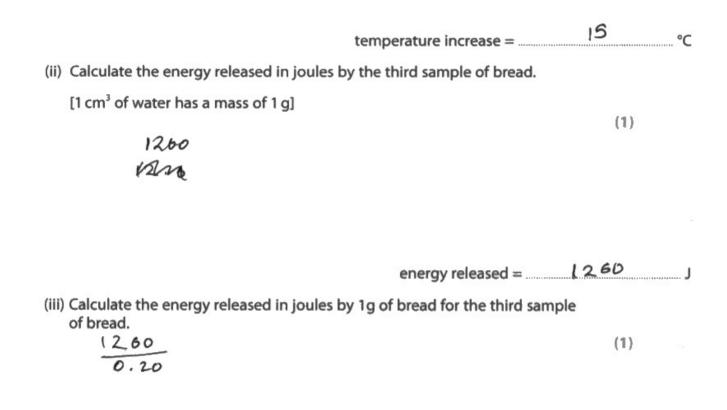
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(1)





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(a) To calculate the energy released from the burning bread the student uses this formula.

energy (in J) = mass of water (in g) \times 4.2 \times increase in temperature (in °C)

They then calculate the energy in joules released by 1 g of bread.

(i) Calculate the increase in water temperature for the third sample of bread.

(1)

temperature increase = <u>15</u> °C (ii) Calculate the energy released in joules by the third sample of bread. [1 cm³ of water has a mass of 1 g] (1)

e	energy released = 126	0 ··· J
(iii) Calculate the energy released in joules by 1g of b of bread.	read for the third sample	111
4020		(1)

energy released by 1g = 4020 J



Question 2 (b)

Students were told that the energy value given on the packaging of the bread is 10 400 J for 1 g of bread: comment on why the student's method gives a different value. Most responses scored at least two marks with the best responses gaining all five marks for noting that the student value was much lower. They also commented that not all of the energy was released from the bread as it was not completely burnt. They also explained that energy was lost to the atmosphere such as when transferring the bread to the tube or relighting the sample. Credit was also given for the flame being affected by draught or the water not being stirred.

(b) The energy value given on the packaging of the bread is 10400 J for 1 g of bread. Comment on why the student's method gives a different value.

incomplete combustion took place instead of complete.
Heat energy loss to surrounding.
Heat energy loss to surrounding. Human error such as misreading the number
Shown on thermometer.
Distance
times of repeatition not enough to onderminate
anome envors.
The result on packaging is obtained with a more accurate method.
more accurate method.
lelit
a energy lost during temoving telighted bread back to place.
relighted bread back to place.



This answer scores full marks for reference to misreading of temperature rise, incomplete combustion, energy loss to surroundings, the method not being repeated enough times, and energy lost during moving or relighting the bread. (b) The energy value given on the packaging of the bread is 10400 J for 1 g of bread. Comment on why the student's method gives a different value.

(5) The mass of simple plonead are different each times, this will effect the result; There are heat loss in this process, the norm temperature or the wind the temperature increase of noter. Also the and burning bread and boiling tube may different eac time, this will affect the conduction to nater, the result also might be effected & There be some human enor, & like the reading of tomperature, the student might not read it a porizontally. There are heat loss in environment. also



This answer scores four marks for heat loss, wind affecting flame, misreading the thermometer and the bread being different distances from the tube.

Question 2 (c)

In item 2(c) students were asked to give two ways that the student could modify this apparatus to achieve an answer nearer to the energy value given on the packaging of the bread. Most responses scored one with the best ones giving using a stirrer or a lid or insulating the tube.

(c) Give two ways that the student could modify this apparatus to achieve an answer nearer to the energy value given on the packaging of the bread.

(2)Use insulating material on test tube to prevent heal loss (eg foil) 1 2 Use bung to trap heat in the boiling tube to prevent heat loss. This scores both marks for insulation and using a bung. (c) Give two ways that the student could modify this apparatus to achieve an answer nearer to the energy value given on the packaging of the bread. (2)on top of the boiling tube Add a 1 2 Change the needle into plastic monde. This scores one mark for using a lid.

Question 3 (b)

See below.

(b) These cells form the lining of the small intestine. Explain how the structure of the small intestine is adapted for absorption.
(4)
The wall of vills is one cell thick, which shortens the diffusion distance between the absorbed food and the capillaries.
Numerous minor vills present on the surface of these vills to increase surface area for the absorption of food substances.
There is a broad witnest not more of capilories in the cells, which allowed absorbed food to be transported around montain a stack of fluine.



This answer scores four marks for describing the wall of the villi as one cell thick for faster diffusion, villi and microvilli to increase surface area, and capillaries to carry away substances maintaining diffusion gradient. (b) These cells form the lining of the small intestine.

Explain how the structure of the small intestine is adapted for absorption.

	(4)
the ileum is supplied with millions at villus	
- villus has millions at microuillus projections increasing surface	
area to volume ratio for diffusion and active transport	
- villus is supplied by capillaries creatiz a steep o	
gradient for dittaisn	
- lacteal is present so larger mélenules like trisl Can be absorbed.	y <i>cerid</i> ic
- the villus well wall i only one cell thick distrision distance	
- human is narrow so increasing contact surface and	en with fast
- it has lots of mitchondria producing ATP for article	



This response also scores four marks for describing how villi and microvilli increase the surface area, capillaries to maintain the diffusion gradient, lacteals to absorb triglycerides, and the villi walls are only one cell thick minimising diffusion distance.



This response gives each structure and explains how they improve absorption.

Question 3 (c)

In this item students were asked to describe the role of the human placenta. Most responses were able to describe how the foetus receives glucose or amino acids from the placenta and the placenta removes waste products such as urea and carbon dioxide from the foetus. The better responses also described how the placenta provides oxygen from the mother to the foetus.

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(c) Cells in the human placenta also have microvilli.

Describe the role of the human placenta.

Allows substances such as glicose oxygen, vitamins
and minerals to be transferred from the mother's blood
. to the developing fortus's blood via diffusion. waste
products such as carbon dioxide, and usea can also
be transferred from the foetus is blood to
the mother's 6100d. Also prevents the entry
of pathogens from the mother's blood to
the footus's blood.



This response gains all three marks for describing the passage of oxygen and glucose from the mother to the foetus and the removal of carbon dioxide and urea from the foetus to the mother. (c) Cells in the human placenta also have microvilli.

Describe the role of the human placenta.

The human placenta's function is to provide a Jetus with nutrients, the oxygen and water. The placenta diffuse these substances from the humans blood to the fetus', which help it stay grow.



This response scores two marks for the passage of oxygen and nutrients from the mother to the foetus.

(3)

Question 4 (a)

In this item students were given three graphs showing how the oxygen level, the number of bacteria, the number of mayfly nymphs, and the number of tubifex worms in the river changed with the distance from a sewage outlet. They were asked to comment on the changes in the measurements as the distance from the sewage outlet increases. Almost all responses gained some credit with many responses gaining full credit.

(a) Comment on the changes in the measurements as the distance from the sewage outlet increases.

You should use information from the graphs and your own knowledge in your answer.

(5)sewage c neares NOM Ve oxua 0 actería ree wage DI Densen TOIN Sources Dewo bugo 1360 new aus Phia 40 5 necies CRIM was 0 neso A D acn am D 1276 Ø mean no NON 20 anaeno and DL O)CY 9e.



This response scores five marks for commenting that the oxygen level falls near the outlet but rises further away, and that the bacteria numbers fall further away and that it is bacterial respiration that causes the oxygen levels to drop near the outlet. They also note that near the outlet mayfly numbers fall but tubifex can live in low oxygen. (a) Comment on the changes in the measurements as the distance from the sewage outlet increases.

You should use information from the graphs and your own knowledge in your answer.

Near the schage outlet, number of bacteria is high, It decompose the servage und reproduce and use up oxygen For respiration. Oxygen level drops a lot. The number of tubifex worm is high as it can survive without and there is no competition for food with mayfly. There is no may Fly as it survive without oxygen. As distance from sewage increase, water is oxygenated again and sewage is diluted. Bacteria has decomposed all savage so number of bacteria decrease. Number of mayfly increase as oxygen level rise back to normal. There is competition so number of tubifex norm decrease.

(5)



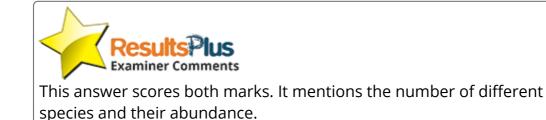
This response also scores five marks making many creditworthy points including: bacteria decompose sewage using up oxygen in respiration so that oxygen falls. The tubifex numbers are high as they can survive in low oxygen but the mayfly numbers drop.

Question 4 (b)(i)

Many students struggled to fully explain what is meant by the term biodiversity. The best answers explained that biodiversity is a measure of variation shown by organisms in an ecosystem based on the number of different species and their relative abundance.

- (b) Scientists often use information about the organisms present in a habitat as an indication of the level of pollution and as a measure of biodiversity.
 - (i) Explain what is meant by the term biodiversity.

biodiversity is the f measure of both the amount (number) of different species as well as the abundance (population) of each species.

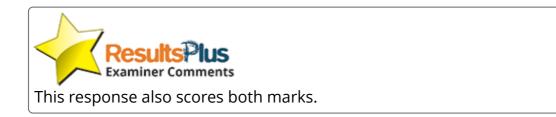


- (b) Scientists often use information about the organisms present in a habitat as an indication of the level of pollution and as a measure of biodiversity.
 - (i) Explain what is meant by the term **biodiversity**.

(2)

(2)

A my variety of	different species	that an in the same	ecosystan.
e.g. many plants and anim	up of difformit species	and the measurement of	how many
the ac.			-



Question 4 (b)(ii)

In this item many students could use the information from the graphs to suggest how the number of mayfly nymphs and the number of tubifex worms can be used to indicate the level of pollution. High mayfly and low tubifex indicate low pollution whilst high tubifex and low mayfly indicate high pollution.

(ii) Suggest how the number of mayfly nymphs and the number of tubifex worms can be used to indicate the level of pollution.

(2)

If the number of maytly nymphs are low and the number of

tubitex worms are high, it indicates that the level of of

pollution is high.



(ii) Suggest how the number of mayfly nymphs and the number of tubifex worms can be used to indicate the level of pollution.

(2)worms thrive in pollu mphs Canot o an indice large numb viver aven' '15 or



Question 5 (a)

- Effect on Location of **Organ that** target cells Hormone releases hormone target cells and tissues Pituitony Overiles overy growth of follicle FSH relean of egg ovaries LH pituitary [[]] maintam uteru uterus ovaries progesterone lining skin surfare. testosterre growth of body hair testes
- 5 (a) The table gives some information about different hormones.

Complete the table by giving the missing information.

(6)



This response gains all six marks for correct hormones, organs that release them, target cells and effects.

5 (a) The table gives some information about different hormones.

Hormone	Organ that releases hormone	Location of target cells	Effect on target cells and tissues	
FSH	pituitary	ovaries	growth of follicle	
LH	pituitary	ovaries	release of egg during me	
progesterone	ovaries	uterus	thacken the uterns lining	
testosterone	testes	skin	growth of body hair	

Complete the table by giving the missing information.

(6)

This response also gains all six marks for correct hormones, organs that release them, target cells and effects.

5 (a) The table gives some information about different hormones.

Hormone	Organ that releases hormone	Location of target cells	Effect on target cells and tissues		
FSH	ovaries	overies	growth of follicle		
LH	pituitary	ovaries	stimulates relacise		
progesterone	ovaries	uterus	maintenins ling of years		
testorore	testes	face, armpit, Penis	growth of body hair		

Complete the table by giving the missing information.

(6)

This scores five marks as the organ that releases FSH is incorrectly named as the ovary.

Question 5 (b)

In item 5(b) students were asked to give three differences between hormones and neurotransmitters. Only the best students were able to gain all three marks for answers that included hormones are carried in the blood plasma whilst neurotransmitters are discharged into synapses. Hormones are produced in endocrine glands whilst neurotransmitters are produced in the presynaptic cell; that hormones have target cells throughout the body whilst a neurotransmitter effects one neurone; finally that hormones produce long term effects whilst neurotransmitters effects are shorter.

(b) Give three differences between hormones and neurotransmitters.

1 Hormones are part of the endocrine system, neurotransmitters are part of the newors system. Hormones travelinblood, not in sympose 2 Neurotransmitters are released from the press neptic membrere, Normanes are released from the glands. 3 Neurotionsmitters convert dectored impulses to chemical impulses for a short period of time (diffusion). Hormenus remain over a long time as

(3)



This response gains all three marks for reference to hormones travelling in the blood. Neurotransmitters being released from presynaptic cell and neurotransmitters having a short term effect. (b) Give three differences between hormones and neurotransmitters.

(3) 1 Hormones travel in the blood neurotransmitters closit 2 Hormones that take longer to act than neurotransmitters 3 Hormones have a longer Lasting effect men neurotransmitters.



Question 6 (a)

In this item many students could clearly describe the stages scientists could use to clone a male horse.

6 Scientists can now produce farm animals by cloning. Since Dolly the sheep was born in 1996 many different species have been cloned.

The form of cloning used is called somatic cell cloning.

The first ever clone of a champion racehorse was announced in 2005 in Italy.

The foal was cloned from Pieraz, a world champion in long-distance horse races.

(a) Describe the stages scientists could use to clone a male horse.

(4)

Take an adult cell from the male horse needed to be cloned Take an legg cell from a volunteered female house Insert the nucleus from adult cell into an enucleated female agg cell. Par electricity to start/trigger the cell division by mituris enter the zygote in a rurrogate formal horner uterus. Take and and wait for birth offspring is a clone of the male home.



This answer clearly describes taking a nucleus from a body cell of the male horse and inserting it into an enucleated egg cell. The cell is given an electric shock to stimulate mitosis. It also refers to the use of a surrogate mother.

6 Scientists can now produce farm animals by cloning. Since Dolly the sheep was born in 1996 many different species have been cloned.

The form of cloning used is called somatic cell cloning.

The first ever clone of a champion racehorse was announced in 2005 in Italy.

The foal was cloned from Pieraz, a world champion in long-distance horse races.

(a) Describe the stages scientists could use to clone a male horse.

******	To clove a male horse, the scientists would need to
	take the nucleus out of a somatic cell from one male
,	horse (the parent horse) and insert it into a denudeated (fenale) egg cell from another horse. The scientists must then
,	take this cell and put it inside a third norse known
******	as a surrogate horse and electrocute it. This will
	trigger nitosis (cell division) in the surrogate horse
	to create a clone of the original male horse.





This answer could be improved by including reference to cell division to produce an embryo that is inserted into the uterus of a surrogate mother. (4)

Question 6 (b)

In 6(b) students were told that Pieraz was castrated (had his testicles removed) at a young age. They were then asked to explain why this stopped him reproducing normally but did not stop him being used to produce a foal by cloning. The best answers referred to him being unable to produce sperm so not being able to fertilise an egg; however he still has normal diploid body cells that can be used for cloning.

(b) Pieraz was castrated (had his testicles removed) at a young age.

Explain why this stopped him reproducing normally but did not stop him being used to produce a foal by cloning.

Testicles produce semen which contains sperms that contain mole gameter. Without it. the Pieraz cannot produce sperm to fertilise an egg thorefore it cannot reproduce sexually soit is infertile. Cloging is do not require Pieroz to have male gamate so it only require nucleus of its body rell to clone.

(3)



(b) Pieraz was castrated (had his testicles removed) at a young age.

Explain why this stopped him reproducing normally but did not stop him being used to produce a foal by cloning.

He cannot pto reproduce normally since he cannot priduce and to dissence of ferter any sperm, the gamete needed for fertilisation. However, since doning only requires a nucleon from dry budy cen, he is still able to provide that.



(b) Pieraz was castrated (had his testicles removed) at a young age.

Explain why this stopped him reproducing normally but did not stop him being used to produce a foal by cloning.

(3)20 It can't produce sperm as fir testicles are removed "he can't state reproduce normally. But cloning does not require sperm. just the nucleus from body cell is reeded, so cloning is still possible on him.



This answer gains two marks. One for not being able to produce sperm and the second for explaining that cloning uses the nucleus from a body cell.

(3)

Question 6 (c)

This item asked students to suggest why horseracing does not allow the use of non-natural methods of breeding, including cloning. Most students gained a mark for suggesting that using cloning would make the competition unfair. Other possible answers are listed in the mark scheme.

(c) Suggest why horseracing does not allow the use of non-natural methods of breeding, including cloning.

(1)

Cloning results in decirable characteristics without training the horse, and this isn't

fair to other competitors. Also, cloning may be banned due to ethnical reasons.



(c) Suggest why horseracing does not allow the use of non-natural methods of breeding, including cloning.

(1)

Unethical and all booses may be identical making it impossible to make borsesacing



(c) Suggest why horseracing does not allow the use of non-natural methods of breeding, including cloning.

									(1)
Cloning	B	umethical	as	H	can	lead	to	gontic	discours	berny
passed			14 14 14 14 14 14 14 14 14 14 14 14 14 14	*****				0	1111.000	*****



Question 6 (d)

Finally in question 6 students were asked to state one difference between cloning an organism and genetically modifying an organism. Most answers stated that clones are genetically identical whilst gene modification produces an organism with a different genome.

(d) State one difference between cloning an organism and genetically modifying an organism.

(1)cloning preduces a genetically identical cop of an organism while GM uses modifies one (Total for Question 6 = 9 marks)



(d) State one difference between cloning an organism and genetically modifying an organism.

doning a organism is producing another gastically identical organism while sentically and ifying an organism is changing the the gaves of an organism.

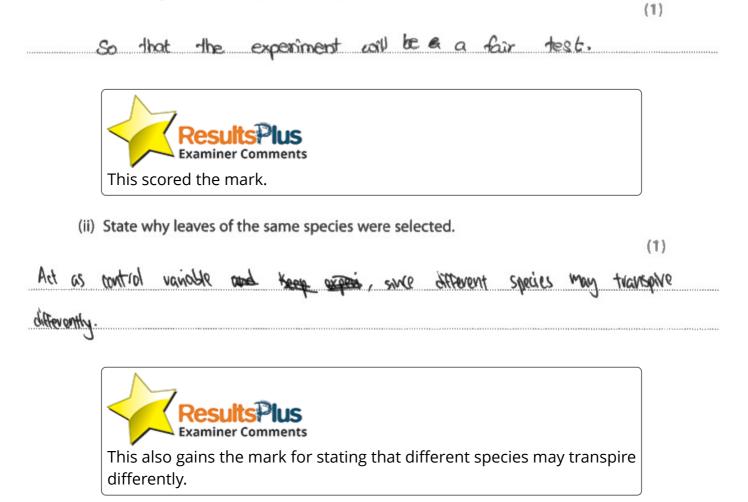
(1)



Question 7 (a)(ii)

See below.

(ii) State why leaves of the same species were selected.



Question 7 (b)(i)

In this item most students could calculate the percentage change in mass for leaf 3.

Leaf	Surface covered	Initial mass in g	Final mass in g	Percentage change in mass (%)	
1 upper surface		3.2	2.4	25	
2	lower surface	3.2	3.0	6.3	
3	both	3.1	3.0	3.2	
4	none	3.1	2.2	29	

(b) The table shows some of the student's results.

(i) Calculate the percentage change in mass for leaf 3.

(2)

percentage change = 3.2 %



(b) The table shows some of the student's results.

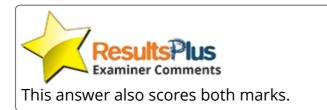
Leaf	Surface covered	Initial mass in g	Final mass in g	Percentage change in mass (%)	
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3	both	3.1	3.0	3.2-	
4	none	3.1	2.2	29	

(i) Calculate the percentage change in mass for leaf 3.

3.1 - 3.0 = 0.1 $0.1 \pm 3.1 = 3.2 \%$

percentage change = 3.2 %

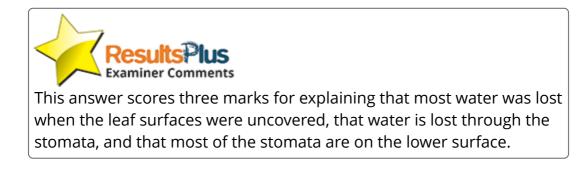
(2)



Question 7 (b)(ii)

(ii) Explain the differences in water loss from the four leaves in the student's experiment.

(3)los the nost was -1 cu A3 601 Could ESCA Wata lower 500 Locla A MAAT AN bon doori 6 Coc alter si line



(ii) Explain the differences in water loss from the four leaves in the student's experiment.

(3)

mitales WAter was (VH when as the 1timas Nort no nere covered Could Still when to exprovale. When the allow For appin and uppe swfall was covered we uneed due less Water evaporated compared to when no suffues occurring on the WEER W mainly lows SWIFALL -tv uppy Sur Hay inticle that prevents dready has 9 waxy molt uter loss covered Surface. Least aund nher transpiration both water whalls nor as ho evolvate MAU Wow allowed -tu er WA. guard whs on the lover N The doing of the Armaya Which CNWM trono pravim Control the ma when Leff open.

This response also scores three marks for explaining that most water is lost when no surfaces are covered, that most water is lost from the lower surface, and that the waxy cuticle reduces water loss from the upper surface.

(ii) Explain the differences in water loss from the four leaves in the student's experiment.

(3)typer lover surface of the least is where most of the in a leas occurs, this is because the huter Loss stometta are locetted at the bottom and there is a mary Cuticle on the top layer, minimiting everpotration. Water enaporrented through the stomate however if the petroleum selly lapend 15 Caren



This response also gains three marks. It explains that most water loss occurs from the lower surface as this contains most stomata. It also explains that the upper surface has a waxy cuticle which reduces water loss.

Paper Summary

Based on their performance on this paper, students are offered the following advice:

Ensure that you read the question carefully and include sufficient points to gain full credit

In comment items include as many points as there are marks available

Make sure you have practised calculations, especially percentages, and understand and know how to apply formulae

Write in detail and use correct and precise biological terminology

Revise practical work to help in questions about unfamiliar or novel practical procedures. Questions require students to make links between different parts of the specification, so when considering a question remember to use all the knowledge and understanding you have gained throughout the specification

In questions about experiments you need to be able to identify the independent variable, the dependent variable, and control variables

Always read through your responses and ensure that what you have written makes sense and answers the question fully

Grade boundaries

Grade boundaries for this, and all other papers, can be found on the website on this link:

https://qualifications.pearson.com/en/support/support-topics/results-certification/gradeboundaries.html

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