CCEA GCSE SCIENCE: DOUBLE AWARD (MODULAR)

SCIENCE



EXAM QUESTION PACK

PAPER 1 FOUNDATION TIER G8201 PAPERS

STEMUP

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Rewarding Learning

General Certificate of Secondary Education
2012

Science: Double Award (Modular)

Paper 1
Foundation Tier

[G8201]

WEDNESDAY 30 MAY, AFTERNOON

MARK SCHEME

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					AVAILABLE MARKS
1	(a)	(i)	to destarch it/so that any starch present at the end was made during the experiment	[1]	
		(ii)	to kill the leaf/stop chemical reactions boil in **alcohol**/**ethanol**	[2]	
		(iii)	turn off Bunsen burner/use **electronic** water bath	[1]	
		(iv)	blue/black	[1]	
	(b)	(i)	oesophagus; stomach; large intestine/colon; anus;	[4]	
		(ii)	buccal cavity/mouth; rectum;	[2]	
	(c)		Any **two** (adaptation with corresponding explanation) from: Adaptation – microvilli/large surface area; Explanation – increased absorption area/for quicker/more absorption; Adaptation – lots of them; Explanation – more absorption/quicker absorption/more absorption; **or** Adaption – thin epithelium/one cell thick/thin walls; Explanation – short diffusion distance **or** Adaption – permeable or semi-permeable; Explanation – to allow molecules to pass across; **or** Adaptation – good blood supply/blood supply close to the wall; Explanation – main diffusion/concentration gradient/quick distribution around body/maximum distribution around the body; **or** Adaptation – villi can move/muscle in villi; Explanation – to allow more glucose/products of digestion to come in contact; **or** Adaptation – lacteal; Explanation – to allow absorption of fats/fatty acids and glycerol	[4]	15

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AVAILABLE MARKS

2 **(a)** **(i)** cuts out the light/less light;
so that they can't photosynthesise/less p/s; [2]

(ii) bacteria/fungi; [1]

(iii) lack of oxygen/bacteria respire; [1]

(iv) Any **two** from:
don't spread slurry when it is raining;
don't spread slurry too close to the river;
don't spread slurry Oct–Jan (winter)
have **larger** storage tanks
check weather forecast [2]

(v) artificial **fertiliser**/sewage/silage/chemical fertiliser/nitrates/phosphate/detergent/septic tank overflow [1]

(b) A = **stonefly nymphs**; (**or** + bloodworms + snails)
B = bloodworms only;
C = pond snails (**or** + bloodworms); [3]

(c) **(i)** grow crops/development, e.g. roads, housing etc./use wood/diseased trees; [1]

(ii) Any **three** from:
- soil erosion/mudslides/increase flooding
- kill animals/loss of food/loss of habitats/nest sites for animals/disrupt wildlife
- climate change/more global warming/more CO_2 gases/less photosynthesis/loss of ice caps/less oxygen/less biodiversity/reduction in **types** or **species**
- noise/visual or aesthetic **pollution**/other gases, e.g. sulphur dioxide/pollution from housing or industry [3]

(d) **(i)** quadrat [1]

(ii) Any **four** from:
- identify plant species;
- estimate percentage cover;
- calculate average/record;
- repeat several times in one area for reliability;
- repeat in the other area; [4]

If use co-ordinates/line transect/belt transect/throw/random numbers

Quality of written communication [2]

(iii) temperature; thermometer;
light; light meter/sun/LDR
pH; pH meter;
rain/rainfall; rain gauge – measuring cylinder;
wind; anemometer
soil moisture; moisture meter – description of using oven;
humidity; hygrometer;
(Any **pair**) [2]

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					AVAILABLE MARKS
	(e)	**(i)**	sun/sunlight; ***not*** *light*	[1]	
		(ii)	vegetation → beetle → centipede → toad → fox; *(arrows in the correct direction)*	[2]	
		(iii)	more toads eaten by foxes; fewer rabbits available to foxes/kestrel/stoats eat more rabbits/more competition for rabbits/stoat has less voles to eat;	[2]	
	(f)	**(i)**	pitfall (trap); ***not*** *trap on own*	[1]	
		(ii)	the centipedes may have eaten the beetles; **or** distribution may be different/not in the area/beetles only come out during the day/beetles fly ***not*** *beetles can't get in*	[1]	
		(iii)	cover to keep the rain out/stops predation/stops them flying out or escaping/keeps larger animals out	[1]	
	(g)		less light for photosynthesis; top surface of leaves covered **in soot**; less gas exchange/less CO_2 for photosynthesis; stomata/pores on lower surface blocked;	[4]	35
3	**(a)**	**(i)**	labels correct, [1] each	[4]	
		(ii)	vagina/cervix;	[1]	
		(iii)	implantation;	[1]	
		(iv)	placenta/umbilical cord;	[1]	
		(v)	oxygen/glucose/vitamins/minerals/hormones/amino acids/drugs/alcohol/antibodies/named vitamins or minerals/water/carbon monoxide/protein/microbes or named microbes;	[1]	
		(vi)	anywhere on the uterus wall **or** lining – area shaded; ***not*** *in gap*	[1]	
		(vii)	Any **two** from: • cervix dilates/opens/widens • rupture of amniotic membrane/waters break • mucus plug comes away • afterbirth comes away/placenta comes away • birth canal widens	[2]	
	(b)	**(i)**	condom; diaphragm;	[2]	
		(ii)	condom;	[1]	
		(iii)	gonorrhoea/syphilis/chlamydia	[1]	15

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					AVAILABLE MARKS
4	**(a)**	**(i)**	GG and Gg	[2]	
		(ii)	Gg and Gg; Punnett; 1 cross correct; 1 circle around gg;	[4]	
	(b)	**(i)**	male – because have (X chromosome and) **Y** chromosome/ has Y chromosome	[1]	
		(ii)	Down's syndrome; extra chromosome/three chromosome 21s/47 chromosomes;	[2]	
		(iii)	cystic fibrosis/colour blind/dwarfism/albino/haemophilia/muscular dystrophy/PKU/Huntington's	[1]	
	(c)	**(i)**	Any **two** from: • cancer cells have larger nucleus • thicker membrane/bigger/darker membrane • less cytoplasm *accept reverse*	[2]	
		(ii)	**UV** light; ***not*** *light on its own*	[1]	
		(iii)	Any **two** from: • bigger • darker in colour/change in colour • irregular border/ragged edges/changed shape/different shape • spread	[2]	15
				Total	**80**

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Rewarding Learning

Centre Number

71	

Candidate Number

General Certificate of Secondary Education
2011

Science: Double Award (Modular)

Paper 1
Foundation Tier

[G8201]

G8201

THURSDAY 19 MAY, AFTERNOON

TIME

1 hour.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
Write your answers in the spaces provided in this question paper.
Answer **all five** questions.

INFORMATION FOR CANDIDATES

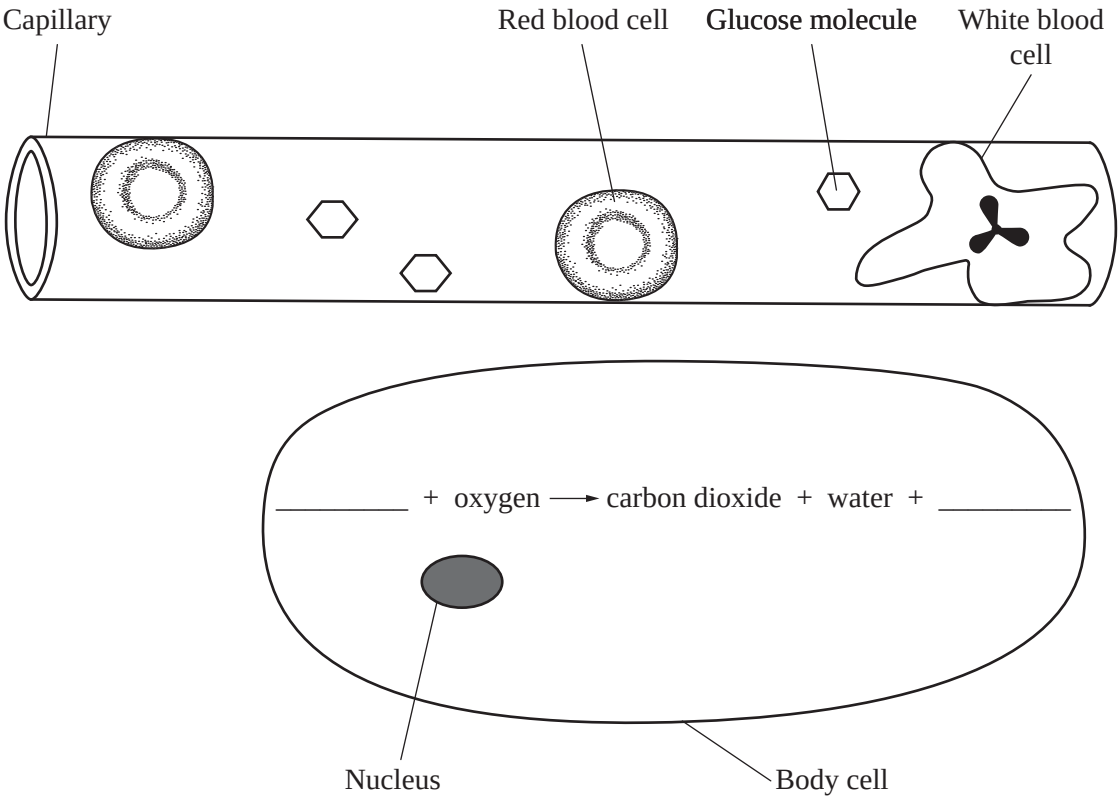
The total mark for this paper is 80.
Quality of written communication will be assessed in question **2(c)**.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.
Details of calculations should be shown.
Units must be stated in numerical answers where appropriate.

For Examiner's use only	
Question Number	**Marks**
1	
2	
3	
4	
5	
Total Marks	

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Examiner Only	
Marks	Remark

1 **(a)** The diagram shows a blood capillary and a body cell.



(i) Complete the word equation for respiration in the body cell. [2]

(ii) How is oxygen carried in the blood capillary?

_____ [1]

(iii) What happens to the carbon dioxide immediately after it has been produced in the body cell?

_____ [1]

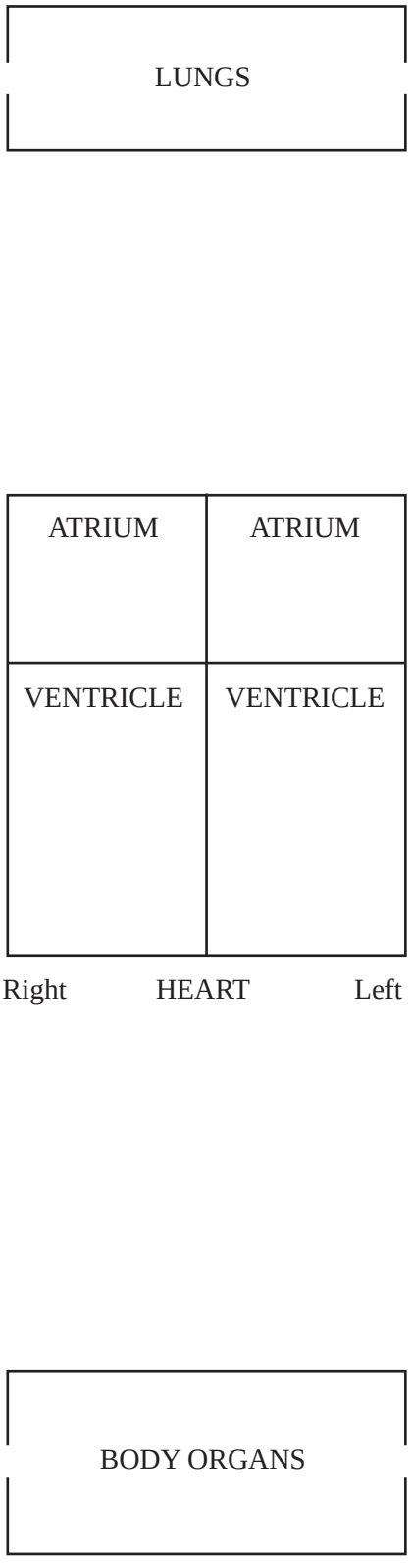
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(Questions continue overleaf)

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(b) The diagram shows the lungs, heart and body organs of a mammal.



Examiner Only	
Marks	Remark

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(i) Complete the diagram by drawing four blood vessels to show the circulation of blood from:

- the body organs to the heart – label as A
- the heart to the lungs and back – label both as B
- heart to the body organs – label as C. [4]

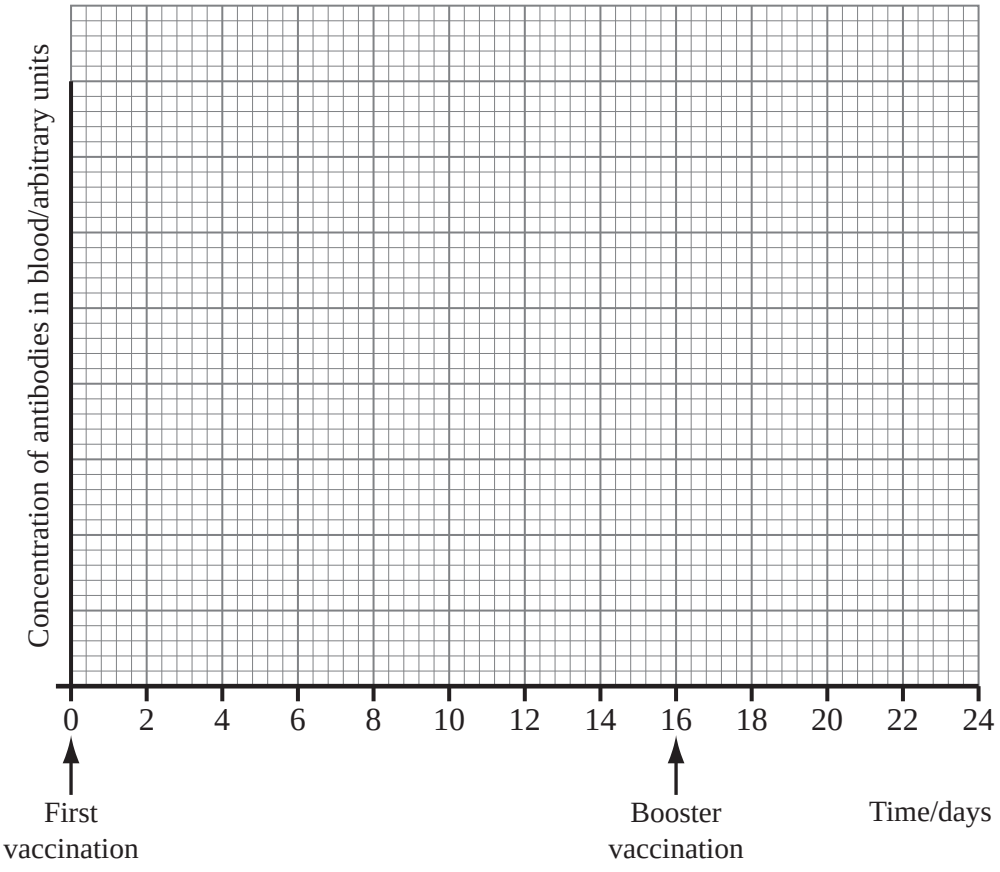
(ii) Name the largest artery in the body. _____ [1]

(iii) Explain why the left ventricle has the thickest muscular wall.

_____ [1]

(c) Some white blood cells in the body provide immunity by producing antibodies. Most vaccinations introduce a modified disease-causing organism into the body.

Draw a line to show what happens to the concentration of antibodies following a vaccination and a subsequent booster vaccination.



[5]

Examiner Only

Marks	Remark

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Examiner Only	
Marks	Remark

2 **(a)** The diagrams below show a reproductive cell from a male and a reproductive cell from a female.

Cell A



© www.natracare.com

Cell B



© www.natracare.com

(i) Name each type of cell.

Cell A _____

Cell B _____ [2]

(ii) Where in the human body is each type of cell produced? Choose your answers from the list below.

Uterus, Ovary, Penis, Vagina, Scrotum, Testes.

Cell A _____

Cell B _____ [2]

(iii) Name the process that occurs when cell A and cell B join.

_____ [1]

(b) When the nucleus of cell A has joined with the nucleus of cell B, the cell undergoes division and develops into a baby.

(i) Where in the body does the baby develop? You can choose your answer from the list in **(a) (ii)**.

_____ [1]

(ii) Approximately how long does it take for a baby to develop fully?

_____ months [1]

(iii) Before it is born, a baby depends on its mother for nutrients and oxygen. Name one type of nutrient that the baby receives from its mother.

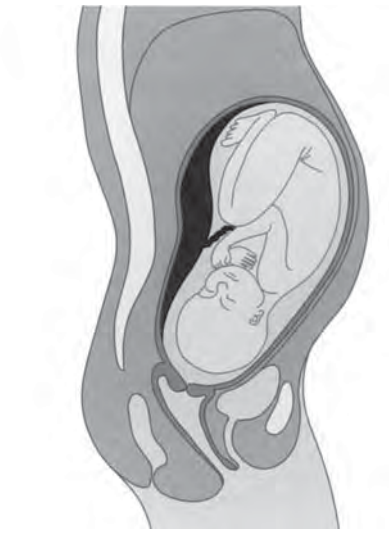
_____ [1]

Examiner Only

Marks	Remark

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(c) The diagram shows a baby just before it is born.



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Use the diagram and your knowledge to describe the process of birth.

The quality of written communication will be assessed in this question.

_____

_____

_____

_____

_____ [3]

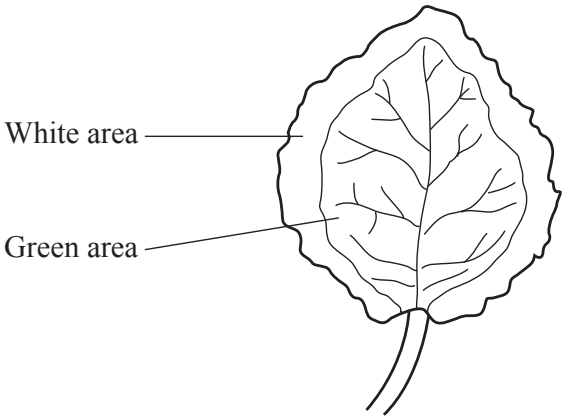
Quality of written communication [2]

Examiner Only

Marks	Remark

Examiner Only	
Marks	Remark

3 **(a)** The diagram shows a variegated leaf.



(i) Name the chemical that is used to test for starch. _____ [1]

(ii) Complete the diagram by shading the area where you would expect to find starch. [1]

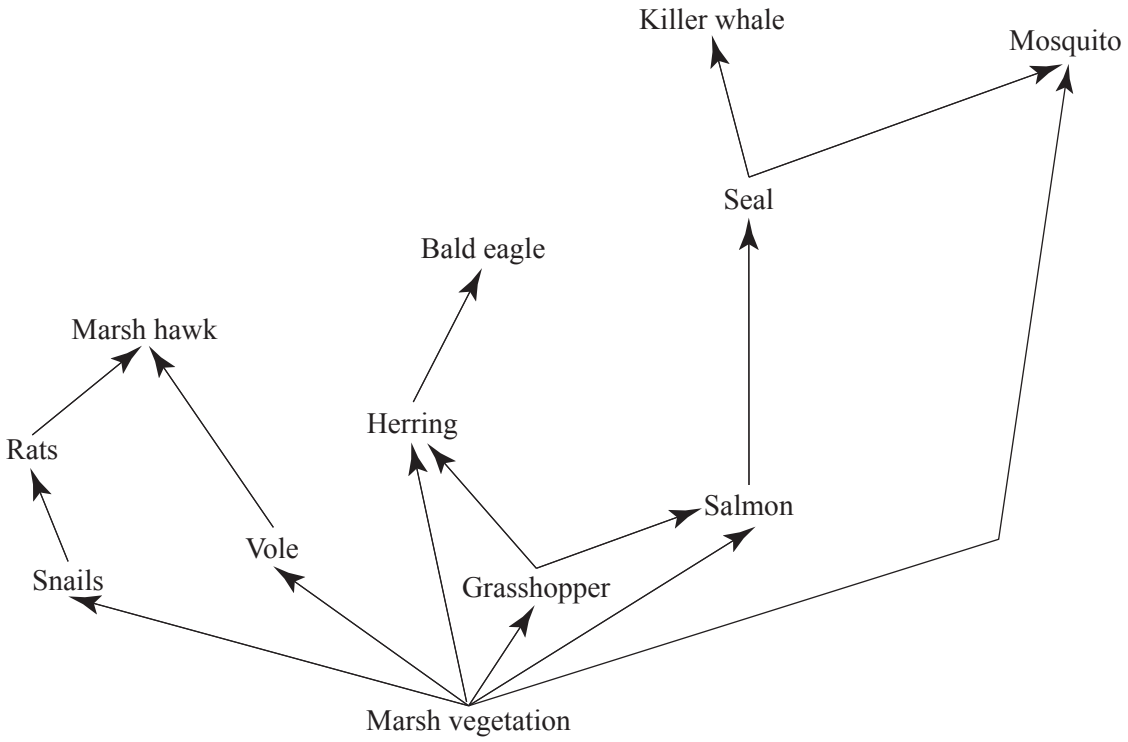
(iii) Explain why you would expect to find starch in this area.

_____

_____ [2]

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(b) The diagram shows a food web.



http://www.acklamgrange.org.uk/science/topics/food_web3.jpg

(i) What is the source of energy for this food web?

_____ [1]

(ii) At what two trophic levels is the herring feeding?

_____ and _____ [1]

(iii) Draw the food chain from the food web where the bald eagle is acting as a tertiary consumer.

[2]

Examiner Only

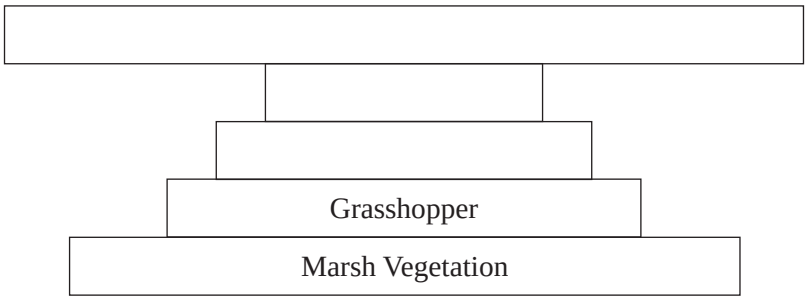
Marks	Remark

(iv) Suggest how the population of salmon might be affected if the herring population was wiped out by overfishing. Explain your answer.

Effect _____ [1]

Explanation _____ [1]

A pyramid of numbers for one of the food chains in the food web is shown below.



(v) Complete the labels on the pyramid with the correct name of the organisms in the food chain. [2]

(vi) On the grid, draw a pyramid of biomass from the pyramid of numbers above.

Beside each level write the name of the organism.

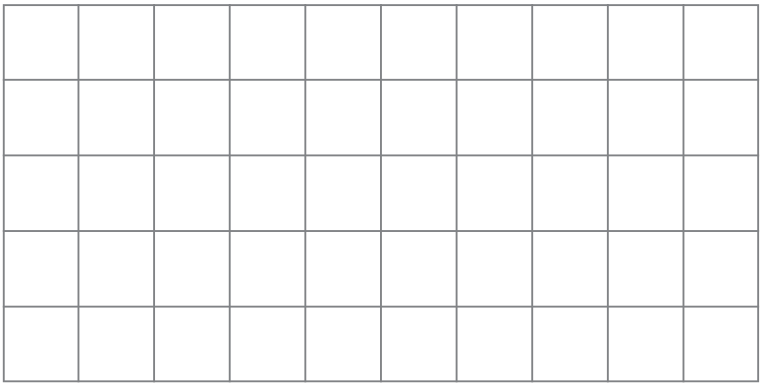
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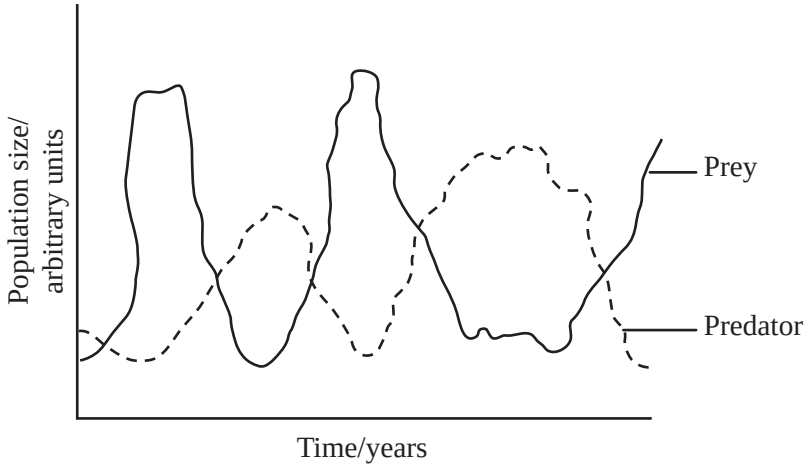
[4]

Examiner Only

Marks	Remark

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(c) The graph shows the population size of a predator and its prey, over a number of years.



© http://scienceaid.co.uk/biology/ecology/predation.html

Use the graph and your knowledge to answer the following questions.

(i) What effect does an increase in the predator population have on the population of the prey? Explain your answer.

Effect on prey population _____ [1]

Explanation _____ [1]

There are a number of factors that can lead to a change in population size.

(ii) Complete the table to show how each factor will affect the population size.

Factor	Effect on population size
Immigration	
Birth rate higher than death rate	
Disease	

[3]

Examiner Only

Marks	Remark

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Examiner Only

Marks	Remark

4 **(a)** Burning of fossil fuels is known to cause pollution.

(i) Some types of pollution caused by fossil fuels are listed below. Draw lines to match the type of pollution to the correct effect.

Type of pollution	Effect
Carbon dioxide	Acid rain
Soot	Reduces photosynthesis in plants
Sulphur dioxide	Global warming

[3]

(ii) Name **two** alternative energy sources that could be used instead of fossil fuels, to help reduce pollution.

1. _____

2. _____ [2]

(b) Melanie would like to recycle more.

(i) Suggest how Melanie could recycle

- glass bottles _____
- vegetable peelings _____[2]

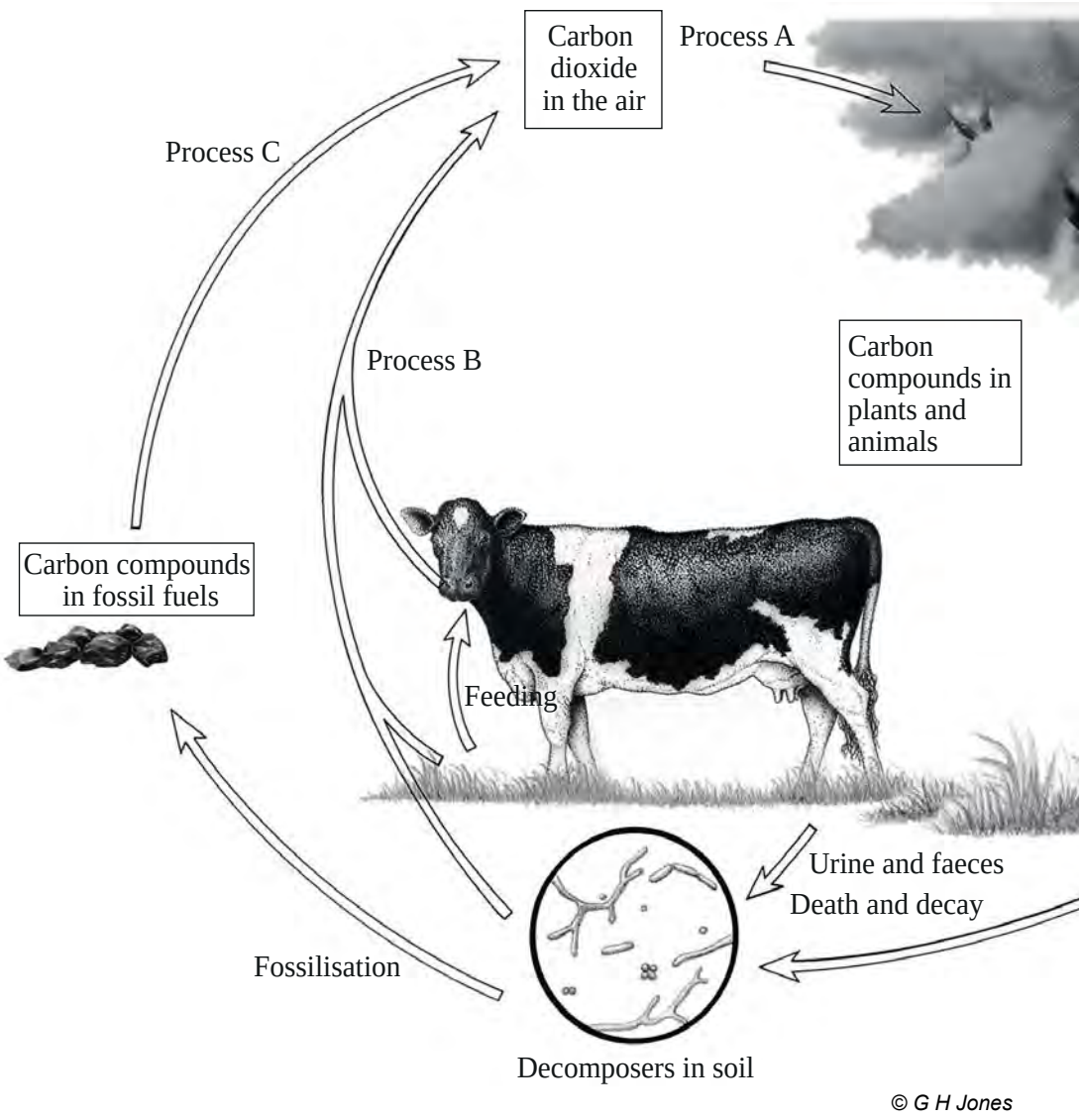
(ii) Suggest **two** benefits, to the environment, of recycling.

1. _____

2. _____ [2]

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(c) The diagram shows part of the carbon cycle.



Use the diagram to give the correct name of the processes A, B and C from the list below.

- Combustion (burning)
- Photosynthesis
- Respiration

Process A _____

Process B _____

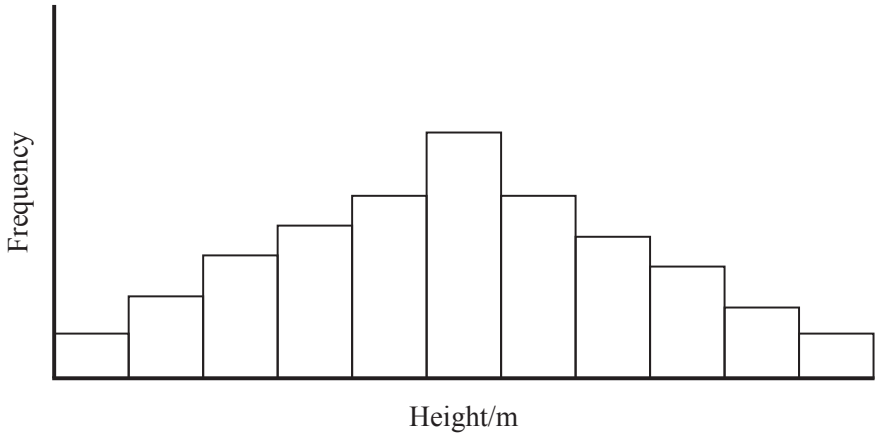
Process C _____ [3]

Examiner Only

Marks	Remark

Examiner Only	
Marks	Remark

5 **(a)** The graph shows how height in a population of animals varies. Height is an example of continuous variation.



(i) State the **two** causes of height variation in this population

_____ and _____ [2]

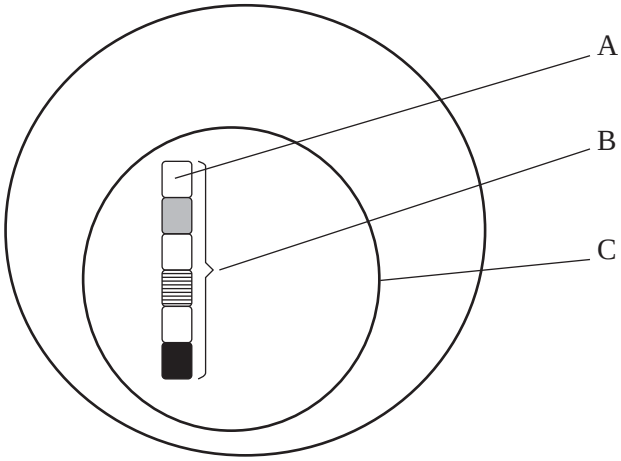
(ii) Suggest the effect on the height average of future populations if the smallest animals couldn't compete for food.

_____ [1]

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Examiner Only	
Marks	Remark

(b) Genes are short lengths of DNA that control a characteristic.
A number of genes make up a chromosome.
Chromosomes are found in the nucleus of a cell. The diagram shows these structures in a cell.



Use this information and your knowledge to name structures A, B and C.

A _____

B _____

C _____ [3]

(c) Some genes control cell division. If these genes are damaged, cancer may result.

(i) What type of cancer is caused when ultra-violet light damages genes?

_____ [1]

(ii) Suggest **two** ways of reducing the risk of developing this type of cancer.

1. _____

2. _____ [2]

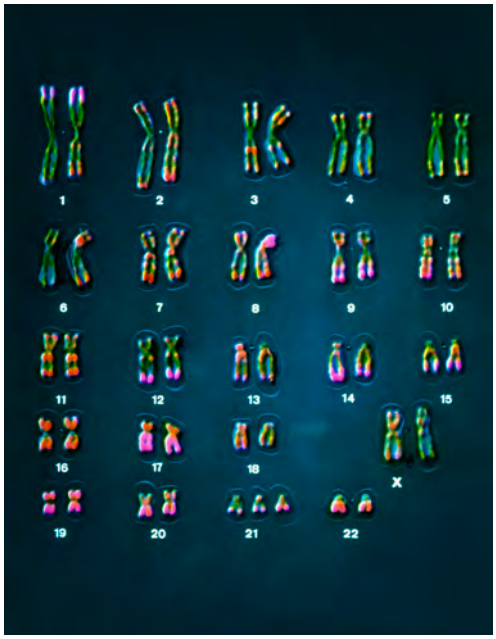
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Examiner Only	
Marks	Remark

(d) Some conditions such as Down's syndrome are inherited.

(i) Name **one** other inherited condition. _____ [1]

The photograph shows chromosomes from a cell of a child with Down's syndrome.



© CNRI/Science Photo Library

Use the information in the photograph and your knowledge to answer the following questions.

(ii) How can you tell that this child has Down's syndrome?

_____ [1]

(iii) What is the gender (sex) of this child? Explain your answer.

Gender _____

Explanation _____ [2]

Examiner Only	
Marks	Remark

(e) The colour of the spots in Dalmatian dogs is determined by a gene. The allele (gene) for black spots is dominant to the allele (gene) for brown spots.



© iStockphoto / Thinkstock

Let B represent the allele (gene) for black spots.
Let b represent the allele (gene) for brown spots.

A Dalmatian which is heterozygous for black spots is crossed with a Dalmatian with brown spots.

(i) Give the genotypes for this cross.

Heterozygous Black spotted Dalmatian	×	Brown spotted Dalmatian
_____		_____ [2]

(ii) Use a Punnett square to show the possible genotypes of the offspring.

[2]

(iii) Give the phenotypes of the offspring and the ratio of the phenotypes.

Phenotypes _____ and _____

Ratio _____ [2]

THIS IS THE END OF THE QUESTION PAPER

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Rewarding Learning

General Certificate of Secondary Education
2011

Science: Double Award (Modular)

Paper 1
Foundation Tier

[G8201]

THURSDAY 19 MAY, AFTERNOON

MARK SCHEME

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					AVAILABLE MARKS
1	**(a)**	**(i)**	sugar/glucose; energy;	[2]	
		(ii)	red blood cell/haemoglobin;	[1]	
		(iii)	diffuses into blood/plasma/tissue fluid	[1]	
	(b)	**(i)**	blood vessel from body organs to right atrium of heart; blood vessel from right *ventricle* of heart to lungs; blood vessel from lungs to left atrium of heart; blood vessel from left *ventricle* to body organs;	[4]	
		(ii)	Aorta;	[1]	
		(iii)	needs to pump blood all around the body	[1]	
	(c)		rises; drops; doesn't drop as low as starting level; quickly rises just after booster (day 16)/steeper gradient than 1st rise; rises to higher level;	[5]	15
2	**(a)**	**(i)**	sperm egg/ovum;	[2]	
		(ii)	testes; ovary;	[2]	
		(iii)	fertilisation	[1]	
	(b)	**(i)**	uterus;	[1]	
		(ii)	9;	[1]	
		(iii)	glucose/amino acids/vitamins/minerals or named/water **not** oxygen/**not** protein	[1]	
	(c)		contractions of uterus; mucus plug comes away; waters break; cervix dilates; baby moves down birth canal; headfirst; umbilical cord is cut; afterbirth; (*any three*) – in correct order	[3]	
			QWC – 2 biological statements	[2]	13

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AVAILABLE MARKS

3 **(a)** **(i)** iodine; [1]

(ii) edges – not shaded & centre shaded [1]

(iii) centre has chlorophyll;
(to traps light) for photosynthesis; [2]

(b) **(i)** sunlight/sun/light [1]

(ii) 2 and 3/2 and 3rd (need both) [1]

(iii) marsh vegetation → grasshopper → herring → bald eagle
(1 correct food chain, 1 arrows) → but must have marsh vegetation [2]

(iv) population increases; more grasshoppers to eat/or more food/less competition for food/more marsh veg to eat; [2]

(v) mosquito as top bar; salmon and seal [2]

(vi) mosquito at top; mosquito smallest; symmetry + pyramid + steps;
all rest bars all labels correct in correct order; [4]

(c) **(i)** Effect – reduces population/number prey
Explanation – more prey eaten/killed [2]

(ii)

Factor	**Effect on population size**
Immigration	Increase
Birth rate higher than death rate	Increase
Disease	Decrease

[3]

21

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AVAILABLE MARKS

4 **(a)** **(i)** CO_2 – global warming;
SO_2 – acid rain;
Soot – reduces photosynthesis [3]

(ii) wind; solar power; wave; tidal power; geothermal;
hydro electric; nuclear; water turbines; *any two* [2]

(b) **(i)** glass – bottle bank/recycling bin/reuse
veg peelings – compost/feed to animals/brown or green bin/
use as fertiliser [2]

(ii) less fuel used transporting rubbish to landfill;
less fuel used in manufacturing new materials;
less artificial fertiliser manufactured;
less raw materials being quarried;
less polluting gases/less CO_2/less global warming/just one gas;
landfill sites not being filled so quickly
less incineration; save forests/resources/fossil fuels
not less pollution/less waste unqualified (*any two*) [2]

(c) A – Photosynthesis;
B – Respiration;
C – Combustion/burning [3] 12

5 **(a)** **(i)** DNA/genetics;
Genes; environment; [2]

(ii) The animals in the population in the future would be taller/average height would be taller [1]

(b) A – gene/allele;
B – chromosome;
C – nucleus/nuclear membrane [3]

(c) **(i)** skin [1]

(ii) *Any two*
cover up (e.g. wear hat);
stay in the shade or out of the strongest sun e.g. 11 am–3 pm;
use a sunscreen;
don't use sunbeds; use fake tan; [2]

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				AVAILABLE MARKS
(d)	**(i)**	Cystic Fibrosis; colour blind/dwarfism	[1]	
	(ii)	There are 3 chromosomes/extra chromosome/ extra No 21 chromosome	[1]	
	(iii)	Female; it has 2 X chromosomes/2 the same chromosomes/ no Y chromosome	[2]	
(e)	**(i)**	Bb, × bb this order;	[2]	
	(ii)	Punnett square; Correct cross;	[2]	
	(iii)	Phenotypes: Black (spots) brown (spots) Ratios: 1 : 1	[2]	19
			Total	**80**

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Rewarding Learning

Centre Number

71	

Candidate Number

General Certificate of Secondary Education
2010

Science: Double Award (Modular)

Paper 1
Foundation Tier

[G8201]

G8201

FRIDAY 21 MAY, MORNING

TIME

1 hour.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
Write your answers in the spaces provided in this question paper.
Answer **all four** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 80.
Quality of written communication will be assessed in question **3(d)**.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.
Details of calculations should be shown.
Units must be stated in numerical answers where appropriate.

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
Total Marks	

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Examiner Only	
Marks	Remark

1 **(a)** Photosynthesis occurs in plant leaves.

(i) Name the chemical in leaves that absorbs light for photosynthesis.

_____ [1]

(ii) Complete the word equation for photosynthesis.

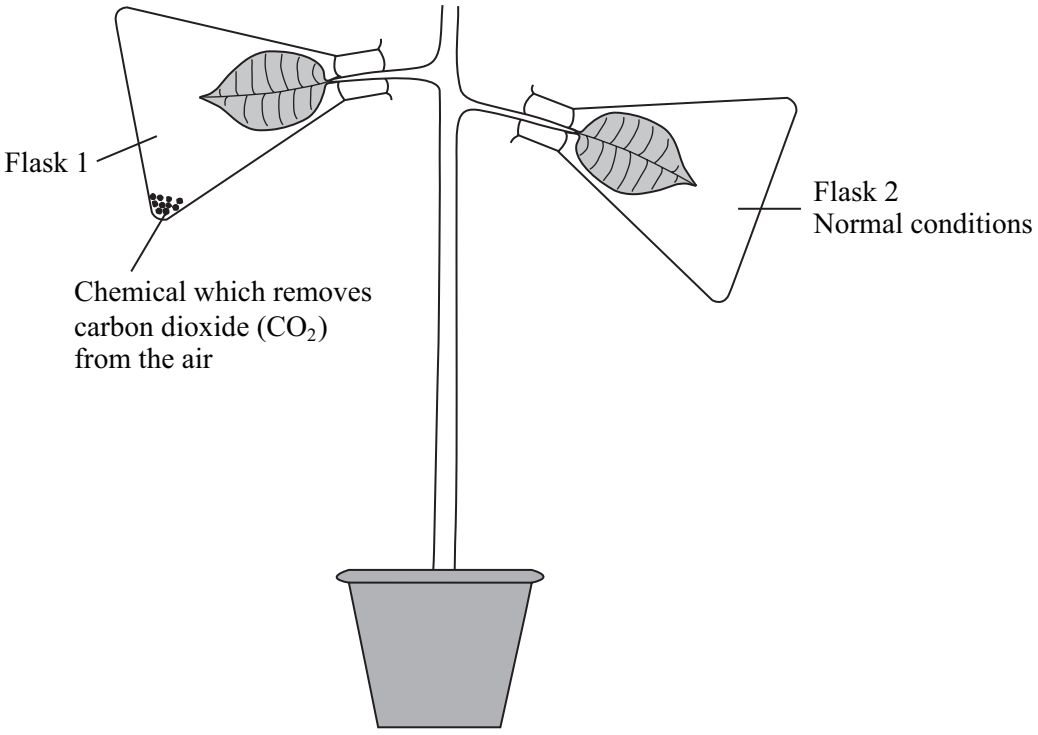
	+		Light →	Glucose	+	

[3]

(b) The diagram shows the apparatus used to investigate if carbon dioxide is needed for photosynthesis.

The plant was destarched and then the leaves were sealed in glass flasks.

The plant was then left in sunlight for 12 hours.

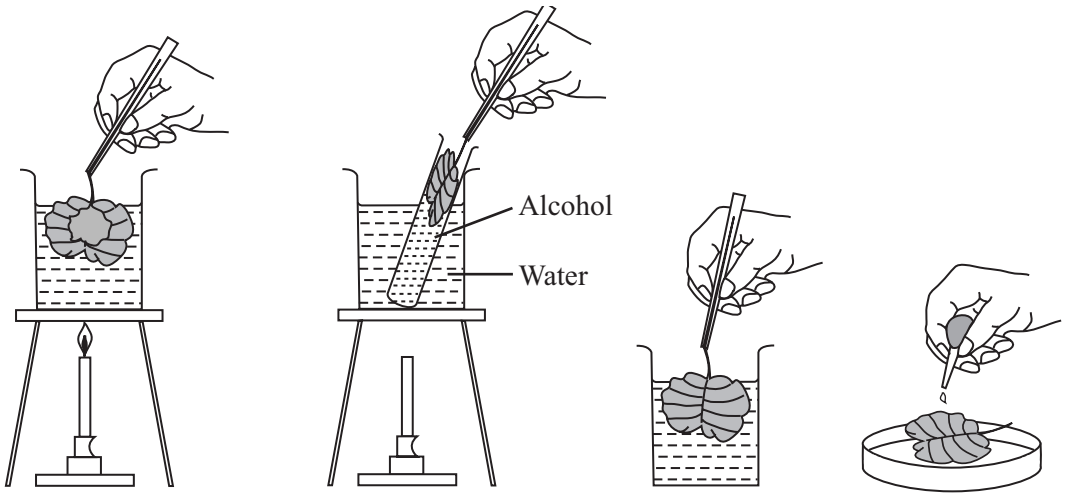


(i) How was the plant destarched?

_____ [1]

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The diagrams show the stages in the starch test on the leaves from the plant.



Step 1 Boil in water

Step 2 Heat in alcohol

Step 3 Rinse in warm water

Step 4 Test for starch

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(ii) What is the purpose of

Step 2 _____

Step 3? _____ [2]

(iii) Why is the Bunsen burner turned off before Step 2?

_____ [1]

(iv) In Step 4, iodine solution is added to the leaves to test for starch.

What colour would you expect to obtain when iodine is added to the leaf from

Flask 1 _____

Flask 2? _____ [2]

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Marks	Remark

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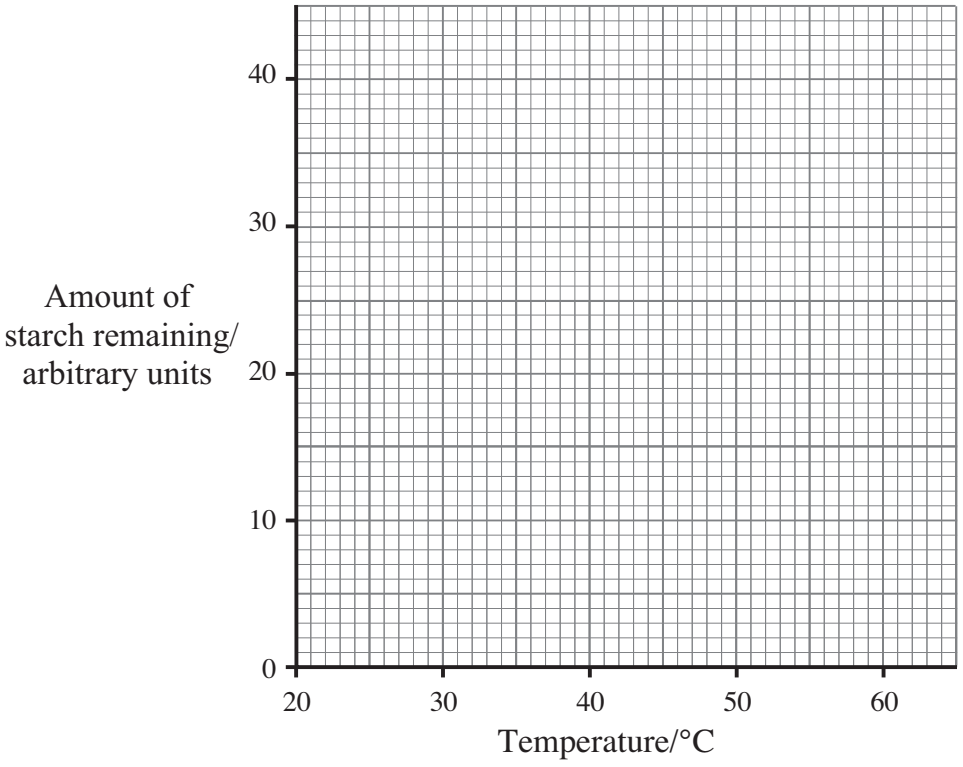
Examiner Only	
Marks	Remark

(c) The enzyme amylase breaks down starch. John carried out an experiment with amylase to see how much starch remained after 15 minutes at different temperatures.

The table gives his results.

Temperature/ºC	Amount of starch remaining/ arbitrary units after 15 minutes
20	30
30	16
40	10
50	25
60	35

(i) Draw a line graph of the results.



[3]

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Use the graph and your knowledge to answer the following question.

Examiner Only	
Marks	Remark

(ii) At what temperature was this enzyme least effective?

_____ºC [1]

Explain your answer.

_____

_____ [1]

(d) The body needs a variety of minerals to stay healthy.

(i) Choose two foods from the list below that contain high calcium levels.

Cheese Beef Oily fish Chicken Lamb

_____ and _____ [2]

(ii) Suggest why pregnant women need to eat calcium rich foods.

_____ [1]

(e) The blood transports digested foods to the cells of the body.

(i) Name the mineral needed to make red blood cells.

_____ [1]

(ii) What is the function of red blood cells?

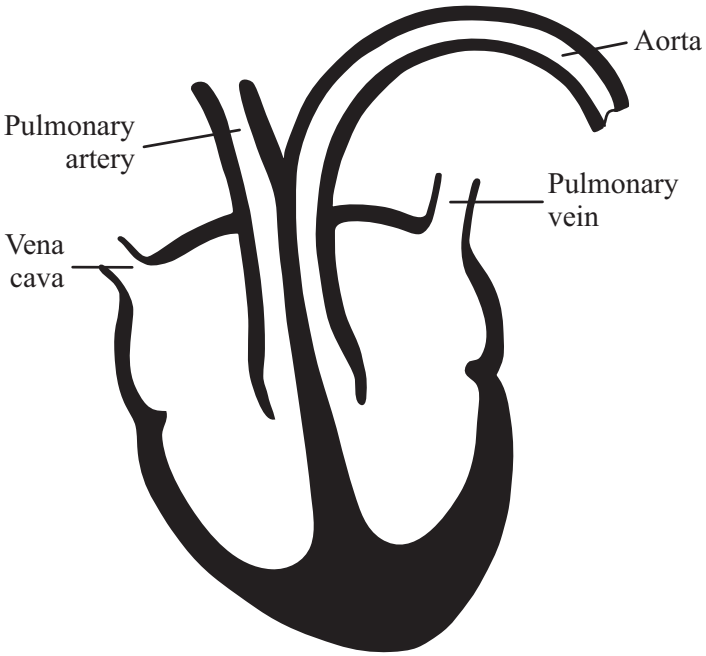
_____ [1]

(iii) The blood travels twice through the heart for one complete circuit of the body.

What term describes this type of circulation? _____ [1]

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(f) The diagram shows a cross section of the heart and its blood vessels.



Use the diagram to help answer the following questions.

(i) Name the blood vessel that carries blood from the heart to the lungs.

_____ [1]

(ii) Which **two** blood vessels shown carry oxygenated blood?

_____ and _____ [2]

Examiner Only

Marks	Remark

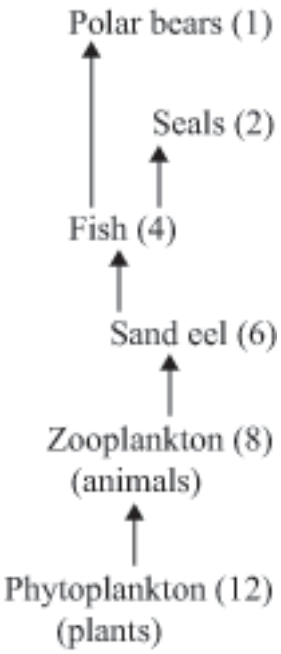
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2 **(a)** The diagram shows a food web for an island in the Arctic.

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Marks	Remark



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Examiner Only	
Marks	Remark

(i) Name the energy source for this food web. _____ [1]

(ii) Use the food web to name

a primary consumer _____

a secondary consumer _____ [2]

(iii) Use the food web to give a food chain with **only** five types of organisms. [3]

_____ → _____ → _____ → _____ _____

(iv) Explain why the phytoplankton (plants) are called producers.

_____

_____ [2]

(v) Suggest why the numbers of zooplankton may decrease during winter.

_____

_____ [2]

(vi) On the grid draw a pyramid of numbers for your food chain in (**iii**).
Use the numbers of organisms shown in the food web.
Beside each level write the name of the organism.

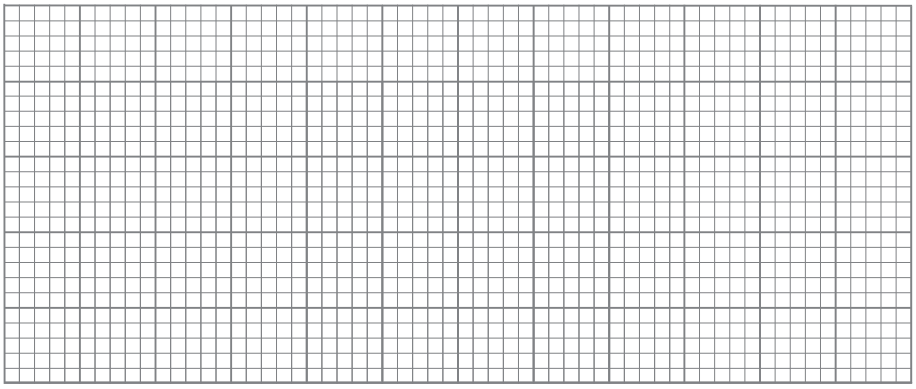
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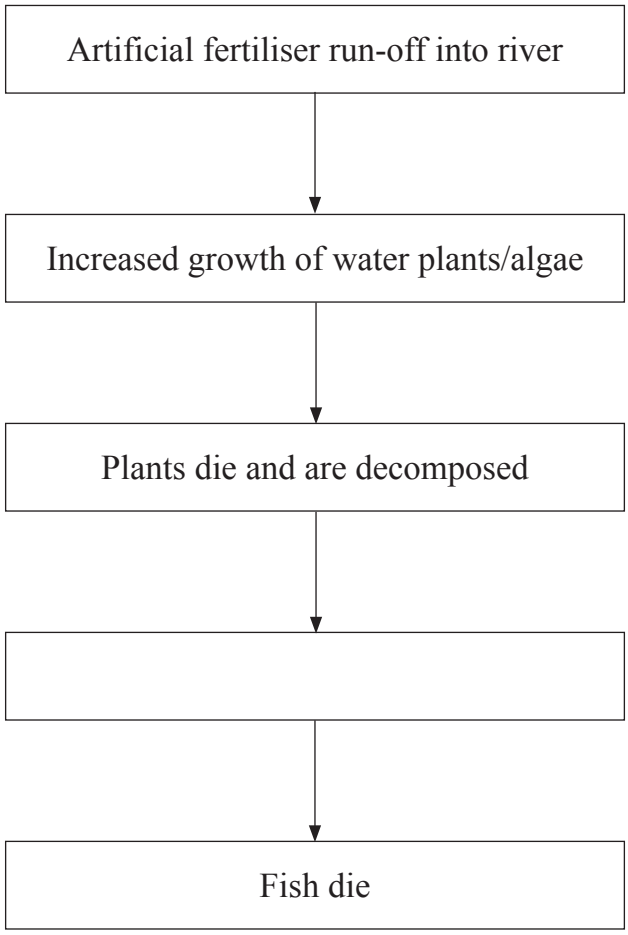
[5]

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(vii) Explain why it is an advantage to the polar bear to have more than one food source.

_____ [1]

(b) The flow diagram shows the effects of artificial fertiliser run-off in rivers.



(i) Complete the empty box in this process. [1]

(ii) Name **one other** substance that could cause the same effect if it entered a river.

_____ [1]

(iii) Explain how hot water from cooling processes can lead to the death of fish if added to a river.

_____ [1]

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Marks	Remark

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Examiner Only	
Marks	Remark

3 **(a)** **(i)** In the space below draw a labelled diagram of a sperm cell.

[3]

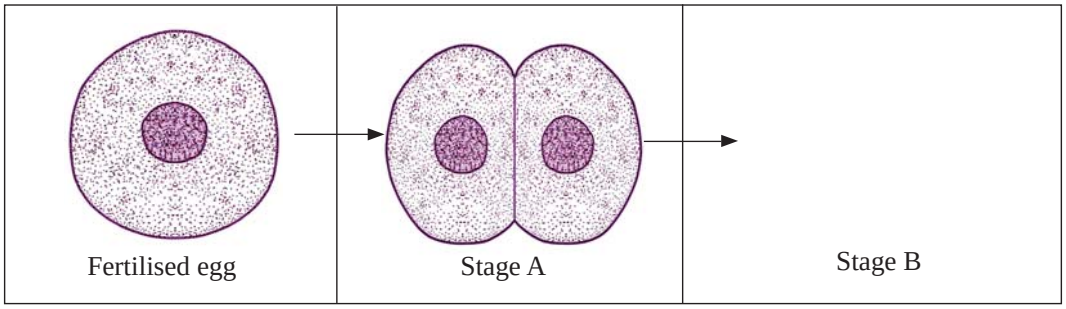
(ii) Give one way this cell is adapted for its function.

_____ [1]

(iii) Name the part of the male reproductive system that produces sperm.

_____ [1]

(b) The diagrams show some stages in the development of an egg after fertilisation.



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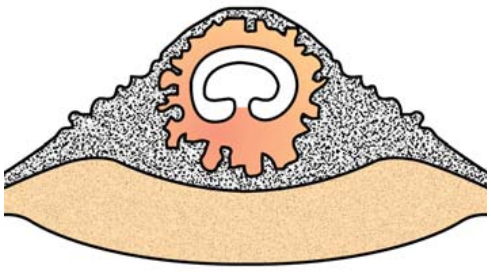
(i) Describe what has happened to the fertilised egg to produce the result at stage A.

_____ [1]

(ii) Complete the diagram at stage B to show what happens next. [2]

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A later stage of development is shown in the diagram below.



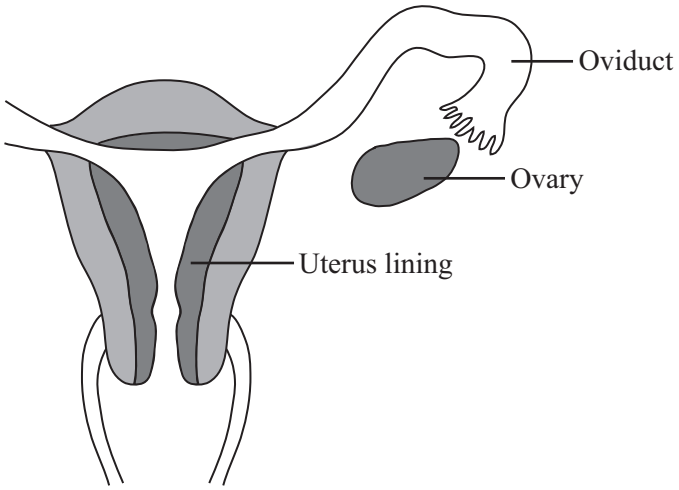
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(iii) Describe what has happened to reach this stage.

_____

_____ [1]

(c) The diagram shows part of the female reproductive system.



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(i) On the diagram mark with an **X** where the process of fertilisation occurs. [1]

(ii) Mark on the diagram with an **I** where implantation will occur. [1]

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Marks	Remark

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(iii) Following implantation the placenta develops.

Give **two** functions of the placenta.

1. _____

2. _____ [2]

Describe one way in which the placenta is adapted for its role.

_____ [1]

(iv) Name the structure that protects the developing baby.

_____ [1]

(d) Describe the process of birth.

You will be assessed on the quality of written communication in this question.

_____

_____

_____

_____

_____ [3]

Quality of written communication [2]

Examiner Only	
Marks	Remark

(e) Gonorrhoea is a sexually transmitted disease.

Examiner Only	
Marks	Remark

(i) Name the type of organism that causes gonorrhoea.

_____ [1]

(ii) The incubation period between getting the disease and showing symptoms can be up to 14 days. How might this lead to the spread of the disease?

_____ [1]

(iii) What is the treatment for this disease? _____ [1]

(iv) Suggest one way in which the spread of this disease may be prevented.

_____ [1]

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Examiner Only	
Marks	Remark

4 Pea plants can produce peas that are wrinkled or smooth.

The gene (allele) for wrinkled is dominant to the gene (allele) for smoothness.

Let R represent the gene (allele) for wrinkled peas.
Let r represent the gene (allele) for smooth peas.

(a) A plant breeder crossed two heterozygous pea plants.

(i) Use a Punnett square to show the possible genotypes of the offspring of this cross.

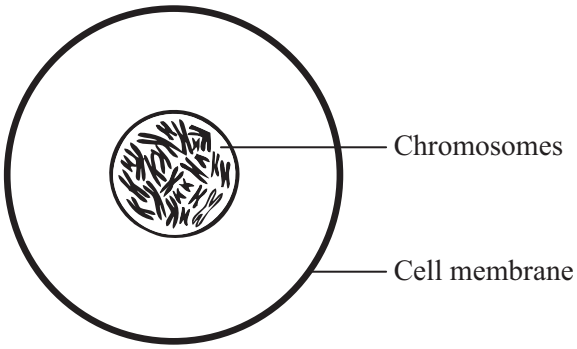
[3]

(ii) Give the phenotypes of the offspring and the ratio of the phenotypes.

Phenotypes _____ and _____

Ratio _____ [2]

(b) The diagram shows a cell with chromosomes.



(i) Where in the cell are the chromosomes located?

_____ [1]

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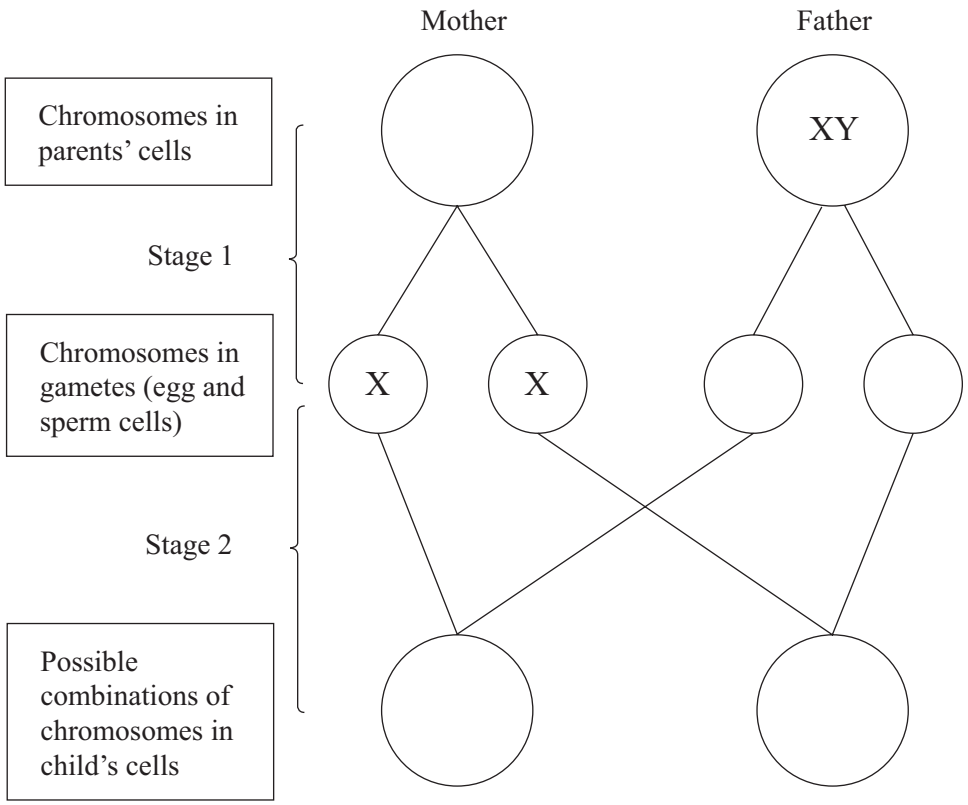
(ii) What are short sections of chromosomes called?

_____ [1]

(iii) What chemical are chromosomes made from?

_____ [1]

(c) The diagram shows how the sex of a child depends on the chromosomes it inherits from its parents.



Complete the diagram above to show the sex chromosomes found in each cell. [3]

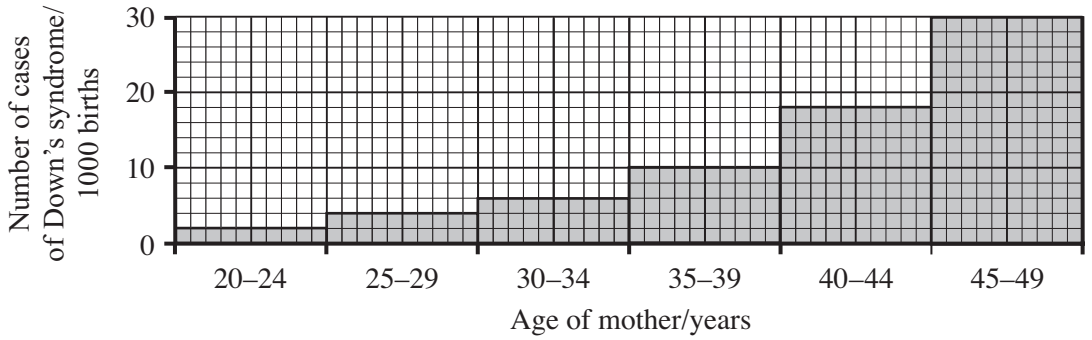
Examiner Only

Marks	Remark

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(d) Down's syndrome is one example of an inherited disease where all the cells of the individual have 47 chromosomes rather than 46.

The histogram shows how the risk of having a child with Down's syndrome increases with the age of the mother.



Use the histogram to calculate how many times more likely it is for a 42 year old woman to have a Down's syndrome baby than a 32 year old woman. Show your working.

_____ times [2]

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Marks	Remark

THIS IS THE END OF THE QUESTION PAPER

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GCSE

Science: Double Award (Modular)

Summer 2010

Mark Schemes

Issued: October 2010

STEMUP.CO.UK

Rewarding Learning

General Certificate of Secondary Education
2010

Science: Double Award (Modular)

Paper 1
Foundation Tier

[G8201]

FRIDAY 21 MAY, MORNING

MARK SCHEME

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				AVAILABLE MARKS
1	(a)	(i)	Chlorophyll/chloroplast; [1]	
		(ii)	Water; CO_2 (either order); oxygen (accept symbols) [3]	
	(b)	(i)	Place in a dark cupboard for **1 day or more** [1]	
		(ii)	Step 2 – remove chlorophyll/green colour/decolourise **Not** kill chlorophyll Step 3 – remove alcohol/soften leaf **Not** kill leaf [2]	
		(iii)	Alcohol is flammable/inflammable **Not** dangerous/explosive/using Bunsen burners [1]	
		(iv)	Leaf 1 – yellow/brown/yellow-orange; (**not** red) (**not** no colour change) Leaf 2 – blue-black/black (**not** blue on its own) (**not** brown-black) [2]	
	(c)	(i)	2 marks for all correct points (–1 per error); 1 mark for points joined with straight lines (allow curve if it join all the points) [3]	
		(ii)	60 °C/60 **or over** [1]	
			Enzyme denatured/described/still a lot of starch left/ enzyme doesn't work [1]	
	(d)	(i)	Cheese; oily fish; [2]	
		(ii)	Bones/teeth [1]	
	(e)	(i)	Iron/Fe **Not** haemoglobin [1]	
		(ii)	Carry oxygen [1]	
		(iii)	Double [1]	
	(f)	(i)	Pulmonary artery [1]	
		(ii)	Aorta; pulmonary vein (either order) [2]	24

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AVAILABLE MARKS

2 **(a)** **(i)** Sun/sunlight/light/light energy; [1]

(ii) Zooplankton; [1]
sand eel; [1]

(iii) Phytoplankton → zooplankton → sand eels → fish ➡ polar bears

[1] mark phytoplankton at start & polar bears at end
[1] mark missing arrow →
[1] mark organisms in between in correct order
(zooplankton – sand eels – fish) [3]

(iv) Produce sugars/food/photosynthesise/starch (**not** produce energy);
Using sunlight; [2]

(v) Less phytoplankton;
due to less light/temp;
Not harsh conditions/**Not** more sand eels eat them [2]

(vi) Pyramid
Numbers 1 – polar bear
4 – fish
6 – sand eels
8 – zooplankton
12 – phytoplankton

[1] symmetrical and pyramid shape
[1] mark numbers correct
[1] mark phytoplankton at base
[1] mark polar bear top/or seals if CM from **(iii)**
[1] mark all other labels correct [5]

(vii) If problem with one food source – still have other/If one dies out/
more to eat [1]

(b) **(i)** Decomposers use up oxygen/microbes use up oxygen [1]

(ii) Slurry/sewage/silage/manure/detergent/farm waste/urine [1]

(iii) Less O_2 present; [1] 19

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					AVAILABLE MARKS
3	**(a)**	**(i)**	Sperm – head with nucleus; tail; 2 for diagram 1 mark for 2 correct labels (Must have nucleus for 3 marks)	[3]	
		(ii)	23 chromosones/tail/swimming/streamlined/pointed head	[1]	
		(iii)	Testes (**Not** scrotum)	[1]	
	(b)	**(i)**	Divided into two/mitosis/divided/duplicated/replicated	[1]	
		(ii)	Divided into four and each with a nucleus; attached;	[2]	
		(iii)	Different/tissues/organs form/implantation/embeds/ development of placenta/umbilical cord/amnion/ named tissue or organ forms/moved to uterus	[1]	
	(c)	**(i)**	In oviduct	[1]	
		(ii)	In lining of uterus & must be above the indent	[1]	
		(iii)	• Diffusion/gas exchange/O_2 from mother/CO_2 from foetus; antibodies from mother; nutrients from mother; urea from foetus; (Any two) • large surface area/or described/good blood supply	[2] [1]	
		(iv)	Amnion/amniotic fluid	[1]	
	(d)		Dilation of cervix; waters break; mucus plug comes away; muscle contractions/umbilical cord cut/afterbirth/baby born usually head first;	[3]	
			QWC	[2]	
	(e)	**(i)**	Bacteria	[1]	
		(ii)	Spread to someone else **before you know you have it**	[1]	
		(iii)	Antibiotics/or named	[1]	
		(iv)	Abstinence/use condoms	[1]	24

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				AVAILABLE MARKS
4	**(a)** **(i)**	Punnett; both parents Rr; Correct cross; R r R RR Rr r Rr rr	[3]	
	(ii)	wrinkled and smooth 3 : 1 must have correct phenotype to get this mark	[1] [1]	
	(b) **(i)**	Nucleus	[1]	
	(ii)	Genes/alleles	[1]	
	(iii)	DNA	[1]	
	(c)	Mother XX; Gametes (X) (Y) ; XX and XY corresponding;	[3]	
	(d) **(i)**	18 : 6; 3 times	[2]	13
			Total	**80**

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