



AQA Biology Paper 1

Higher

Separate Science

Predicted Paper A

Name.....

Date.....

1 hour 45 minutes allowed

Similar to your real exam each question in this gets harder towards the end of each question, so if you find you can do the last part of a certain question, try the next question, they all start off easier then get harder.

Grade boundaries

These are VERY rough guesses! Getting an 8 or 9 on here does not guarantee you the same mark in the exam

- 9 75
- 8 65
- 7 55
- 6 45
- 5 35



Exam Analysis

Question	Marks available	Marks gained	Topic	What do you need to do to improve ...	Bits to help if you don't understand ...
1	12		Cells		https://youtu.be/aM3ZfC1K6W8
2	12		Digestive system		
3	9		Circulatory system		
4	25		Pathogens		
5	21		Plants		
6	5		Drugs		
7	16		Cancer		
Total	100				



Question 1

a) What is the function of mitochondria?

[1 mark]

Circle **one** answer only

A	To carry out photosynthesis
B	Protein synthesis
C	To carry out respiration
D	Cell control centre

b) Roots are cells are specialised to perform, a particular function, describe that function and how the cell is specially adapted for this function. [3 marks]

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c) What is a stem cell?

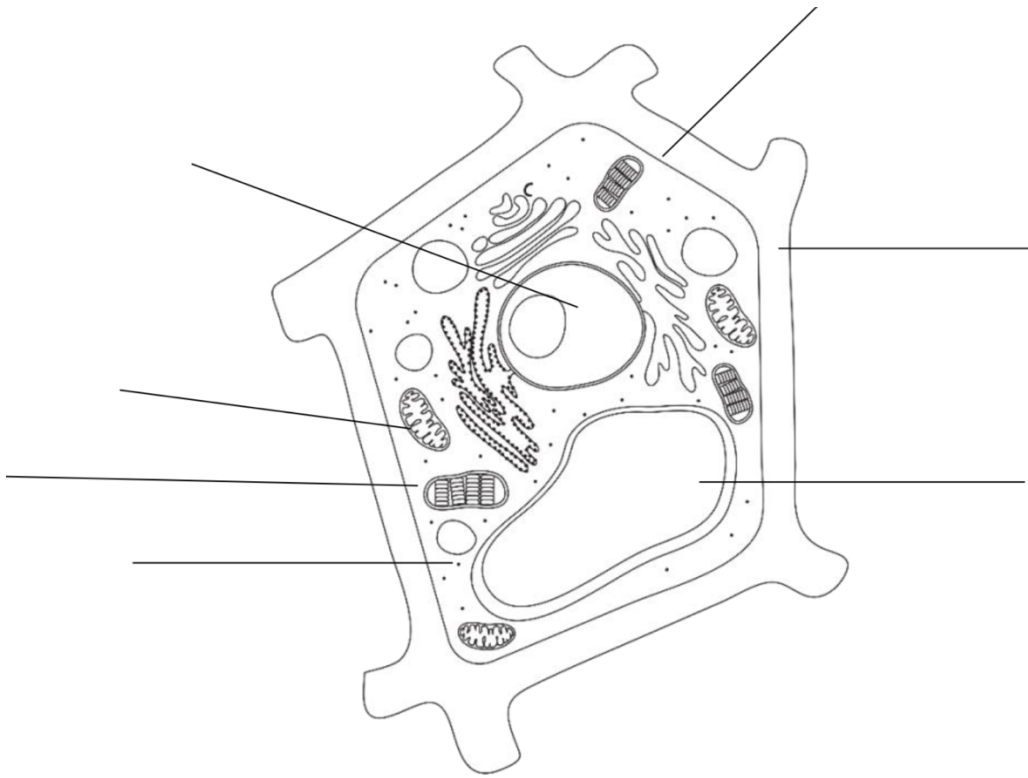
[1 mark]

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d) Label this diagram of a cell

[7 marks]





d) Bile is not an enzyme, but is also important for digestion, describe the job of bile. You should include where is it produced and stored. [4 marks]

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Question 3

a) The circulatory system is responsible for trafficking gases and nutrients around the body, look at the below table and identify the row with the correct set of properties.

Circle **one** answer only

[1 mark]

A	Red blood cells carry carbon dioxide	White blood cells engulf invading bacteria	Plasma transports dissolved substances
B	Serum transports dissolved substances	Red blood cells carry oxygen	Platelets help blood clot
C	Platelets help blood clot	White blood cells engulf invading bacteria	Plasma transports dissolved substances
D	White blood cells engulf invading bacteria	Serum transports dissolved substances	Red blood cells carry oxygen

b) How are red blood cells adapted for their function?

[2 marks]

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Question 4

a) How do bacteria make a person feel ill? [1 marks]

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b) How do viruses reproduce inside the body? [3 marks]

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c) HIV is a virus that attacks the immune system, why has life expectancy change for someone with HIV since HIV was first seen in the 1980's? [2 marks]

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d) Vaccinations are given to children as they grow up, with the first being at 8 weeks old. This means today millions of people are alive who would have otherwise succumbed to preventable diseases. Explain how vaccinations help prevent the spread of diseases. [5 marks]

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e) Antibiotics are another way of preventing illness. How do antibiotics work? [1 mark]

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f) Describe how we can use plates of bacteria to test for antibiotic resistance [5 marks]

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g) In today's society there is an increasing problem of bacteria developing resistance to antibiotics. What can society do to prevent the spread of antibiotic resistant bacteria? [4 marks]

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h) E. coli is a bacteria that can make people very ill, if an E.coli cell is $2\mu\text{m}$ long by $1.5\mu\text{m}$ wide by $0.5\mu\text{m}$. What is the volume of an E. coli cell? [2 marks]

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i) If a different bacterial cell is observed under a microscope using a $120\times$ lens and is measured to be $400\mu\text{m}$ long, what is the actual size of the bacterium? [2 marks]

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Question 5

- a) Plants take energy from the sun and use it to create food, name this process and give the word equation for this process. [3 marks]

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- b) This process is affect by temperature, explain how temperature can have an effect on the function of plants. [3 marks]

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- c) The optimal temperature for this plant in 37°C with a range of 4°C. Use the data below to say how many hours the plant is at optimal temperature. [2 marks]

Time (24hr)	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Temperature (°C)	32	32	33	33	34	34	35	36	37	38	39	37	37	37	36	36	34	33

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d) The effect of light intensity on this process can be following in the lab using pond weed. Describe a practical set up whereby you could follow how changing light intensity affect reactions within a plant. [6 marks]

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e) Plants can also use anaerobic respiration to get energy. Name the process of anaerobic respiration that happens in yeast cells and give the equation. [3 marks]

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f) Within a leaf there are a range of different types of cells, give two of these cells and their function [4 marks]

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Question 6

- a) New drugs are constantly being developed, what are the three things a new drug must be tested for? [3 marks]

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- b) Painkillers can be used by athletes to gain an unfair advantage, explain how. [1 mark]

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- c) Aspirin is a painkiller that has was developed in the early 1800's, what was it developed from? [1 mark]

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Question 7

a) What is cancer?

[3 marks]

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b) Many people that find out that have cancer recover and go on to live a long and healthy life. What is health?

[1 mark]

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c) The BBC reported that over 40% of cancers are lifestyle related. Give 3 ways lifestyle can increase your risk of cancer and the associated cancer.

[6 marks]

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Answers

Question	Answer	Guidance
1a	C	One answer only must be circled
1b	<ul style="list-style-type: none">-thin walls to allow for diffusion-wide growth to roots plant into the ground-large surface area to absorb lots of water	One mark for each bullet point.
1c	-a cell that has the ability to differentiate into any other type of cell	
1d	Clockwise from top... <ul style="list-style-type: none">-cell membrane-Cell wall-vacuole-ribosome-chloroplast-mitochondria-nucleus	One mark for each bullet point.
2a	sugars	1 mark
2b	Teeth-mechanical digestion	1 mark
2c	Examples of scientific points that can be made in the answer <ul style="list-style-type: none">-lock and key mechanism Enzyme is a biological catalyst <ul style="list-style-type: none">-enzyme active site will only fit one substrate-substrate fits into the active site and the enzyme breaks in down into the products-products are released-enzyme can be used again for another reactions-enzymes no not get used up in the reaction	1-2 marks This answer will have some valid points but will lack structure and not be complete 3-4 marks The majority of the points are valid and correct but the answer is lacking scientific clarity 5-6 marks This is a fluid answer, all points mentioned are correct and relevant, and the SPG is almost flawless
2d	<ul style="list-style-type: none">-neutralises stomach acid-emulsifies fats-made in liver-stored in gallbladder	One mark for each bullet point.
3a	C	One answer only, if more than one answer circles award no marks
3b	<ul style="list-style-type: none">-no nucleus/biconcave disc-to allow more space to carry oxygen	One mark for each bullet point.
3c	Similarities	1-2 marks



	<ul style="list-style-type: none">-both have atria at the top-both have ventricles at the bottom-both have valves to ensure blood flows in one direction <p>Differences</p> <ul style="list-style-type: none">-left side have larger muscles to pump blood around the rest of the body instead of just to the lungs-vena cava goes into the right atria-Pulmonary vein comes out of the right ventricle-pulmonary artery goes into the left atria-aorta comes out of the left ventricle	<p>This answer will have some valid points but will lack structure and not be complete 3-4 marks</p> <p>The majority of the points are valid and correct but the answer is lacking scientific clarity 5-6 marks</p> <p>This is a fluid answer, all points mentioned are correct and relevant, and the SPG is almost flawless</p>
4a	toxins	1 mark
4b	<ul style="list-style-type: none">-virus DNA is injected into a cell-virus DNA replicates inside a host cell-cell explodes releasing new viruses	1 mark for each bullet point
4c	<ul style="list-style-type: none">-more recognition of the disease-better drugs	1 mark for each bullet point
4d	<ul style="list-style-type: none">-small amount of dead or inactive pathogen given-allows white blood cells ...-.....to develop antibodies to pathogen-next time a person is infected with the pathogen the immune already has antibodies-immune system can respond faster and person shouldn't get ill	1 mark for each bullet point
4e	Kill bacteria	1 mark
4f	<ul style="list-style-type: none">-disc of antibiotics or antiseptics-Placed on bacterial lawn-Left to grow-Clear zone around discs will reveal sensitivity-Larger zone more sensitive	1 mark for each bullet point
4g	<ul style="list-style-type: none">-complete any course of antibiotics given by the doctor-don't ask doctor for antibiotics-Antibiotics should not be prescribed for viral infections-stop giving animals antibiotics in food	1 mark for each bullet point
4h	$2 \times 1.5 \times 0.5 = 1.5$ μm^3	1 mark for answer 1 mark for unit
4i	(Magnification = measured size/actual size) Actual size = measured size / magnification Actual size = $400 / 120 = 3\mu\text{m}$	1 mark for equation 1 mark for number AND unit



5a	<ul style="list-style-type: none">-photosynthesis-carbon dioxide + water → glucose + oxygen (no marks if light is on left hand side of arrow)- sunlight required. Can be shown above the arrow, but not as a reactant.	1 mark for each bullet point
5b	<ul style="list-style-type: none">-plants work best at optimal temperature-too low enzymes don't have enough energy-too high enzymes become denatured	1 mark for each bullet point
5c	10 hours	2 marks
5d	<p>Method must have logical steps and work</p> <ul style="list-style-type: none">-equipment; beaker, funnel, plasticine, measuring cylinder, 10cm section of pond weed, lamp, meter rule, timer-place pond weed in beaker of water-place the funnel and a filled measuring cylinder over the top of the pondweed-use the meter rule to place the lamp a set distance away-use the stop watch to record a set time-count bubble or volume of gas given off in that set time-move the lamp to a different distance-repeat counting bubbles or volume of gas	<p>1-2 marks This answer will have some valid points but will lack structure and not be complete</p> <p>3-4 marks The majority of the points are valid and correct but the answer is lacking scientific clarity</p> <p>5-6 marks This is a fluid answer, all points mentioned are correct and relevant, and the SPG is almost flawless</p>
5e	<ul style="list-style-type: none">-fermentation-sugar → ethanol + carbon dioxide	<p>1 mark for process</p> <p>1 mark for left hand side</p> <p>1 mark for right hand side</p>
5f	<ul style="list-style-type: none">-spongy mesophyll - large to create air spaces-palisade mesophyll - for photosynthesis-epidermis - cover plant-guard cells - open and close stoma	Any cell type and linked function for two marks up to a total of 4, just listing the cell type gains no marks
6a	<ul style="list-style-type: none">-Dose-Toxicity-Efficacy	1 mark for each bullet point
6b	Play on when hurt	1 mark
6c	Willow bark	1 mark
7a	<ul style="list-style-type: none">-cancer is uncontrolled growth of cells-benign tumours are lumps that are not mobile-Malignant tumours are lumps where the cells have developed to ability to travel around the body	1 mark for each bullet point
7b	-Mental and Physical wellbeing	1 mark
7c	<ul style="list-style-type: none">-Alcohol. Liver or stomach.-Smoking. Lung	2 marks awarded for risk AND cancer up to a total of 6



	<ul style="list-style-type: none">-Obesity. Digestive system-Sun/sunbeds. Skin	
7d	<ul style="list-style-type: none">-a mouse is vaccinated-mouse immune system will start to produce antibodies-the mouse's spleen is harvested and the cells that are responsible for the production of antibodies are removed.-The antibodies are merged with a myeloma cell.-myeloma cells divide rapidly in a lab-the antibodies are harvested from the culture.	<p>1-2 marks This answer will have some valid points but will lack structure and not be complete</p> <p>3-4 marks The majority of the points are valid and correct but the answer is lacking scientific clarity</p> <p>5-6 marks This is a fluid answer, all points mentioned are correct and relevant, and the SPG is almost flawless</p>