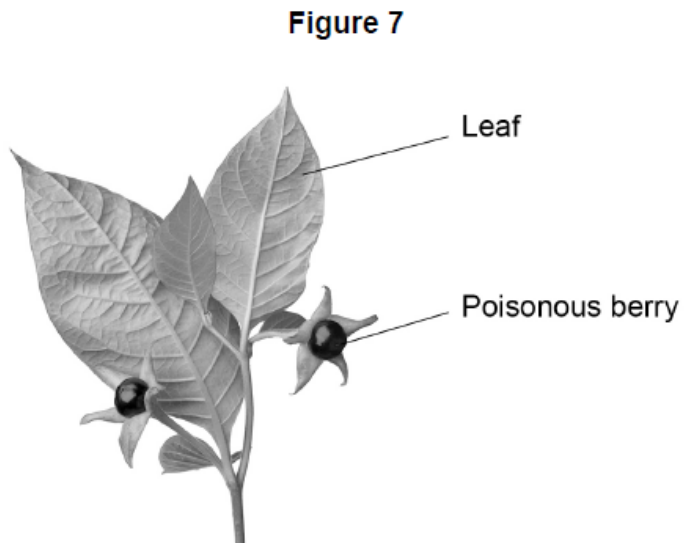


AQA – Principles of Organisation – GCSE Biology1. **May/2020/Paper_1F/No.5****0 5****Figure 7** shows part of a deadly nightshade plant.**0 5 . 1**

How will the poisonous berries help the deadly nightshade plant to survive?

[1 mark]

0 5 . 2

Which type of defence mechanism are the berries?

[1 mark]Tick (✓) **one** box.

Chemical

Mechanical

Physical

Figure 8 shows part of a gorse plant.

Figure 8



0 5 . 3

Suggest how the gorse plant is adapted to defend itself.

[1 mark]

0 5 . 4

The green leaves of the gorse plant make glucose for the plant to use.

What are **two** uses of glucose in the gorse plant?

[2 marks]

Tick (✓) **two** boxes.

For defence

For respiration

To absorb water

To release minerals

To store as starch

0 5 . 5 A student wanted to show that the leaves of a gorse plant contain glucose.

The student crushed the leaves to extract the liquid from the cells.

Describe the method the student could use to test the liquid from the cells for glucose.

Include the result if glucose is present.

[3 marks]

0 5 . 6 The roots of the gorse plant have bacteria that turn nitrogen gas into nitrate ions.

Explain why nitrate ions are needed by the gorse plant.

[2 marks]

0 5 . 7 The roots of gorse plants can be infected by honey fungus.

The honey fungus produces tiny spores underground.

Suggest how the honey fungus spores travel from the roots of an infected gorse plant to the roots of a healthy gorse plant.

[1 mark]

A drug can be extracted from gorse seeds.

Doctors want to trial the drug from gorse seeds to see if it can treat diarrhoea.

0 5 . 8 Which **two** factors must the doctors test the drug for in the trial?

[2 marks]

Tick (✓) **two** boxes.

Appearance

Dosage

Solubility

Taste

Toxicity

0 5 . 9 In the trial some patients will take tablets made from gorse seeds and some patients will take tablets made from sugar.

What are the tablets made from sugar called?

[1 mark]

Tick (✓) **one** box.

Antibiotics

Antibodies

Painkillers

Placebos

2. May/2020/Paper_1F/No.6

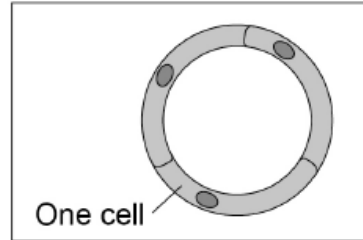
Blood is transported around the body in blood vessels.

0 6 . 1 Draw **one** line from each type of blood vessel to the structure of the blood vessel. [2 marks]

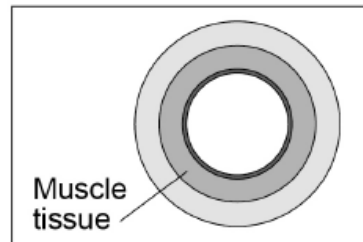
Type of blood vessel

Structure of blood vessel

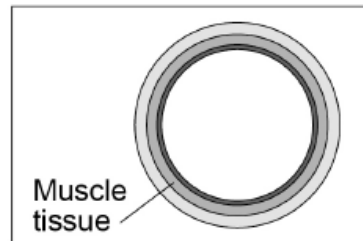
Artery



Capillary



Vein

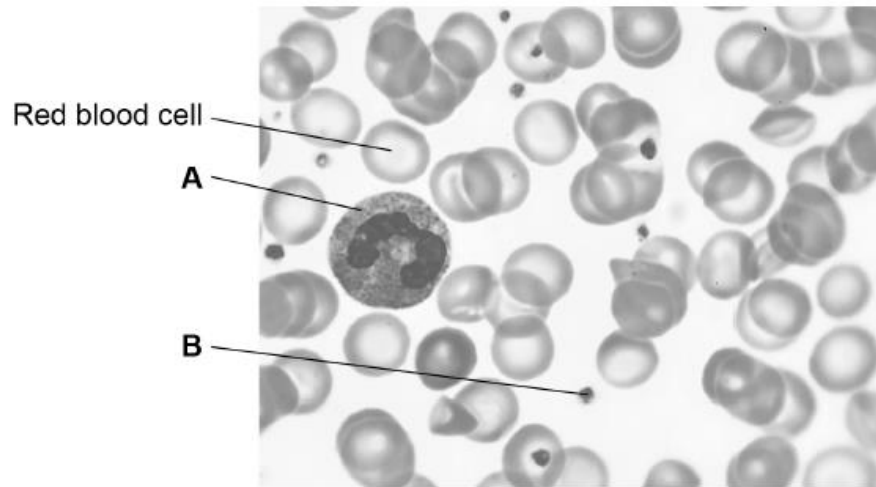


0 6 . 2 Explain how the structure of an artery is related to its function.

[2 marks]

Figure 9 shows blood viewed through a microscope.

Figure 9



0 6 . 3

Name **A** and **B** in Figure 9.

[2 marks]

A _____

B _____

0 6 . 4

A red blood cell:

- has no nucleus
- contains a red pigment called haemoglobin.

Suggest how these adaptations help the red blood cell carry out its function.

[2 marks]

No nucleus _____

Haemoglobin _____

0 6 . 5 The blood components are carried around the body in the liquid part of the blood.

What is the liquid part of the blood called?

[1 mark]

Tick (✓) **one** box.

Cell sap	<input type="checkbox"/>
Plasma	<input type="checkbox"/>
Saliva	<input type="checkbox"/>
Urine	<input type="checkbox"/>

Table 2 shows the results of a man's blood test.

Table 2

Blood component	Patient results	Normal range
Red blood cells	4.8	4.5 to 6.5
Lymphocytes	2.6	1.0 to 4.0
Neutrophils	5.1	1.8 to 7.5
Platelets	50	140 to 400

0 6 . 6 Which component of the man's blood is **not** within the normal range?

[1 mark]

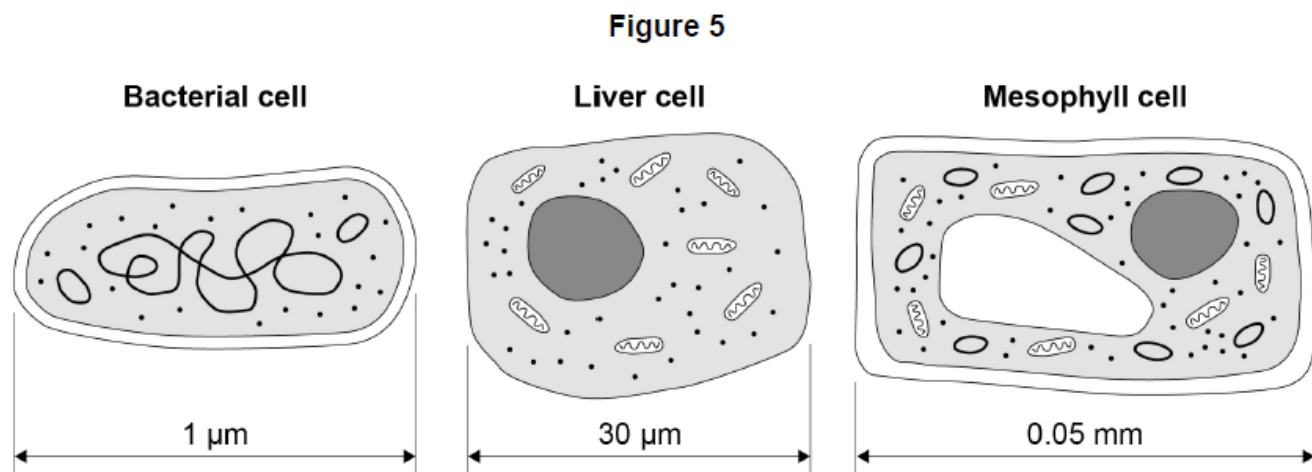
0 6 . 7 Suggest a symptom the man might show.

[1 mark]

3. May/2020/Paper_1H/No.3

0 3

Figure 5 shows three types of cell.



0 3 . 1

Give **two** similarities between the prokaryotic cell and the eukaryotic cells in Figure 5.

[2 marks]

- 1 _____
- 2 _____

0 3 . 2

Give **three** differences between the prokaryotic cell and the eukaryotic cells in Figure 5.

[3 marks]

- 1 _____
- _____
- 2 _____
- _____
- 3 _____
- _____

0 3 . 3

Calculate the ratio of the size of the bacterial cell to the size of the mesophyll cell.

[2 marks]

Ratio = 1 : _____

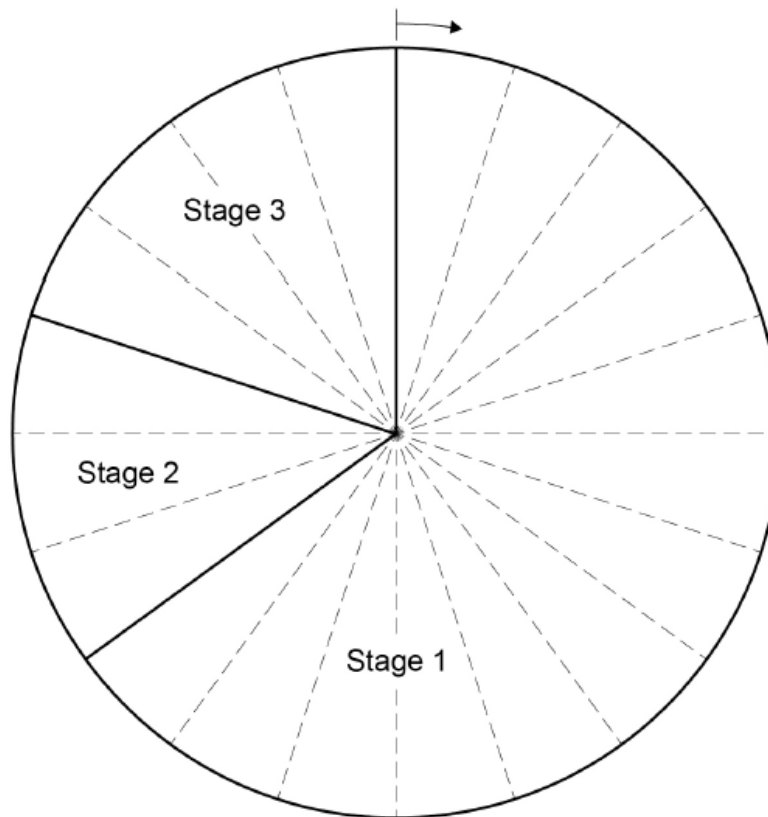
0 3 . 4

Name the type of cell division that produces genetically identical body cells for growth and repair.

[1 mark]

Figure 6 shows a cell cycle.

Figure 6



0 3 . 5

What percentage of the time for one cell cycle is represented by stage 2 and stage 3 together?

[1 mark]

Tick (✓) one box.

7%

35%

40%

65%

0 3 . 6 Describe what happens during each stage of the cell cycle.

[4 marks]

Stage 1 _____

Stage 2 _____

Stage 3 _____

4. May/2020/Paper_1H/No.5

Many plants have evolved defence mechanisms.

Figure 8 shows part of a gorse plant and part of a deadly nightshade plant.

Figure 8



Gorse plant



Deadly nightshade plant

0 5 . 1

The gorse plant has evolved to have sharp thorns.

What type of defence response are thorns?

[1 mark]

0 5 . 2

How do thorns defend the gorse plant?

[1 mark]

0 5 . 3

The deadly nightshade plant has poisonous berries.

What type of defence response are poisonous berries?

[1 mark]

0 5 . 4

A scientist noticed that in one area the gorse plants had yellow leaves and had stunted growth.

One reason for yellow leaves and stunted growth is a deficiency of nitrate ions in the soil.

Explain **two** other possible reasons for the yellow leaves and stunted growth.

Do not refer to nitrate ions in your answer.

[5 marks]

Reason 1 _____

Explanation _____

Reason 2 _____

Explanation _____

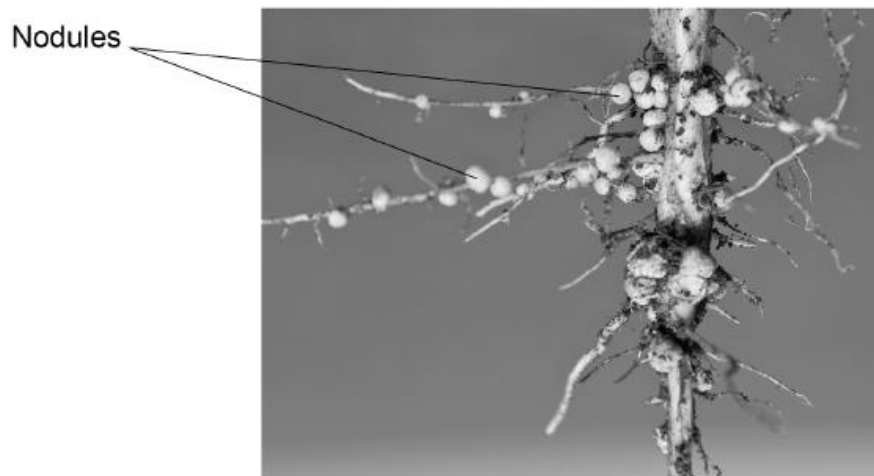
The gorse plant has nodules on its roots.

The nodules are part of the living root tissue.

Bacteria which convert nitrogen gas into soluble nitrate ions live in the nodule tissue.

Figure 9 shows the nodules on the roots.

Figure 9



0 5 . 5

Suggest how the nodules benefit the bacteria.

[2 marks]

0 5 . 6

Explain how the nodules benefit the gorse plant.

[2 marks]

0 5 . 7 For many years drugs have been extracted from plants.

Which plant material was chewed as a painkiller?

[1 mark]

Tick (✓) **one** box.

Blackcurrant berries

Foxglove leaves

Rose petals

Willow bark

5. May/2020/Paper_1H/No.6

Data from 'The Million Women' survey in the UK was collected for over 15 years.

Scientists analysed the data to study the effect of consuming alcohol on liver disease.

The scientists:

- included 400 000 women who regularly consumed alcohol
- included 400 000 women who did **not** consume alcohol
- excluded women who already had a liver disease.

0 6 . 1 Age and gender were two factors controlled in this analysis.

Many other factors were also controlled.

Suggest **two** other factors which the scientists would have controlled.

[2 marks]

1 _____

2 _____

The data was analysed for:

- women who drank alcohol with meals
- women who drank alcohol **not** with meals
- women who did **not** drink alcohol.

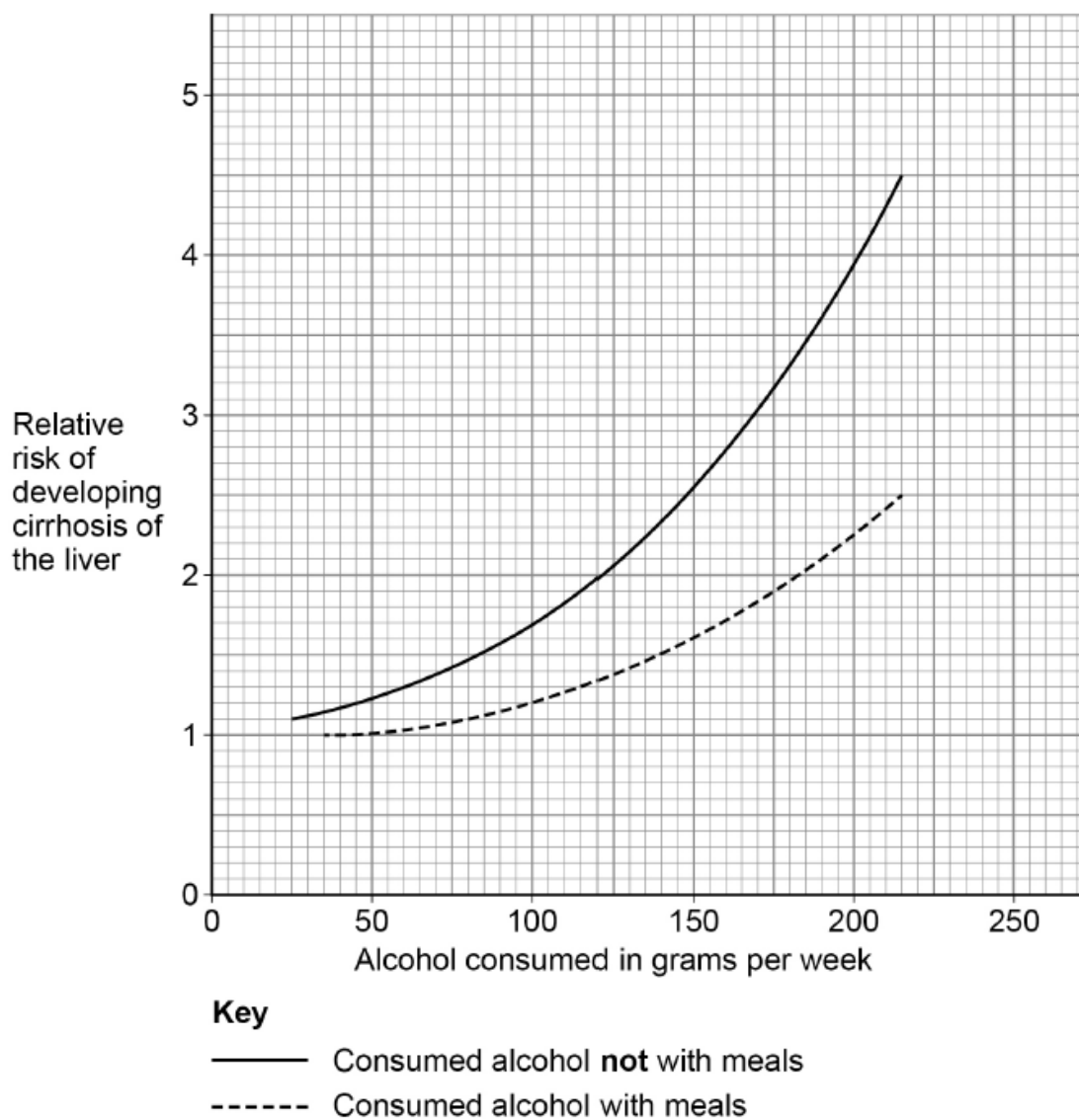
During the survey approximately 1500 women developed a liver disease called cirrhosis of the liver.

Scientists calculated the relative risk of developing cirrhosis of the liver for each group who consumed alcohol.

A relative risk of 1.0 means there was no statistical difference between the groups who did consume alcohol and the group who did **not** consume alcohol.

Figure 10 shows a summary of the results.

Figure 10



0 6 . 2 A woman drinks 150 g of alcohol per week **not** with meals.

The woman decides to change to drinking 150 g of alcohol per week with meals.

Calculate the percentage decrease in relative risk of developing cirrhosis of the liver for this woman.

[2 marks]

Percentage decrease = _____ %

0 6 . 3 One glass of wine contains 12 g of alcohol.

A different woman drinks two glasses of wine each day with her meals.

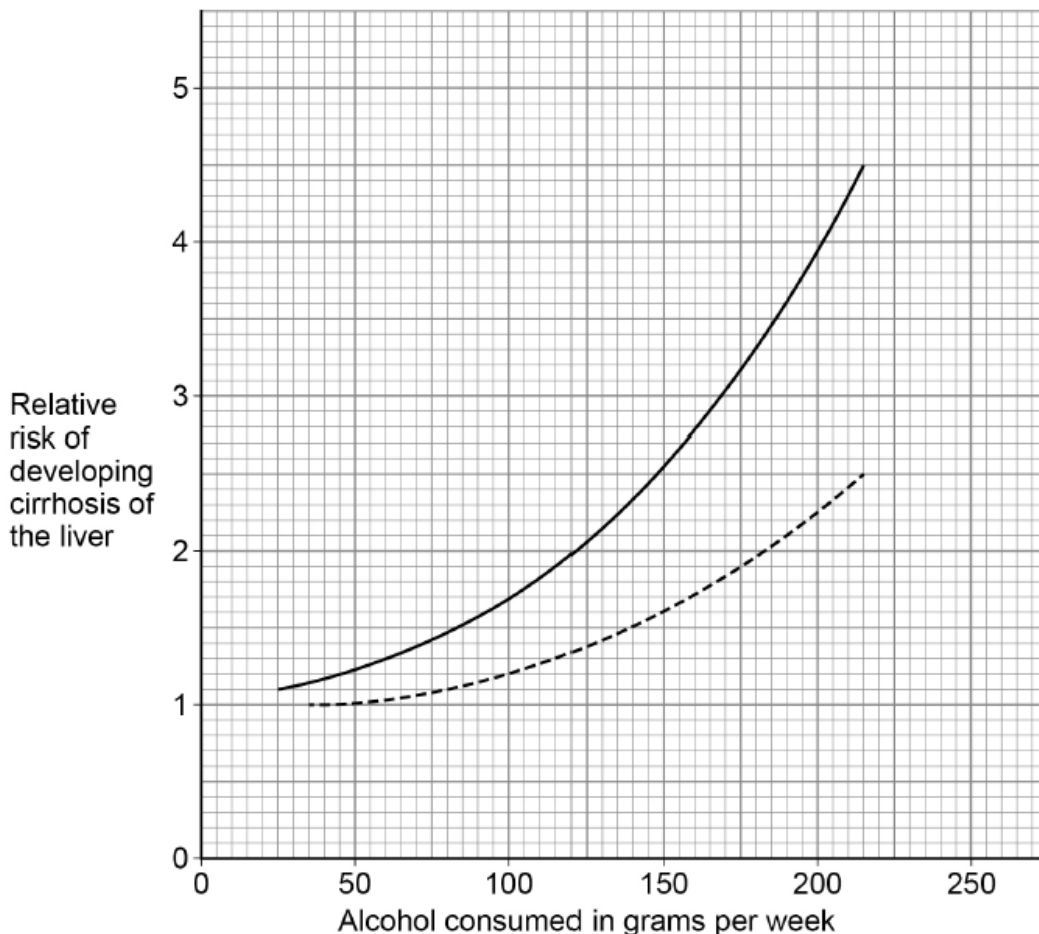
Calculate the relative risk of developing cirrhosis of the liver for this woman.

[2 marks]

Relative risk = _____

Figure 10 is repeated below.

Figure 10



Key

- Consumed alcohol **not** with meals
- - - Consumed alcohol with meals

0 6 . 4

Consuming alcohol with meals instead of not with meals decreases the relative risk of developing cirrhosis of the liver.

Give **two** other conclusions about the relative risk of developing cirrhosis of the liver related to alcohol consumption.

Use data from **Figure 10** in your answer.

[2 marks]

- 1 _____

- 2 _____

0 6 . 5

Suggest **two** reasons why the data is considered to be valid.

[2 marks]

1 _____

2 _____

0 6 . 6

Suggest **one** aspect of the survey which might reduce validity.

[1 mark]

0 6 . 7

Cirrhosis of the liver leads to liver failure.

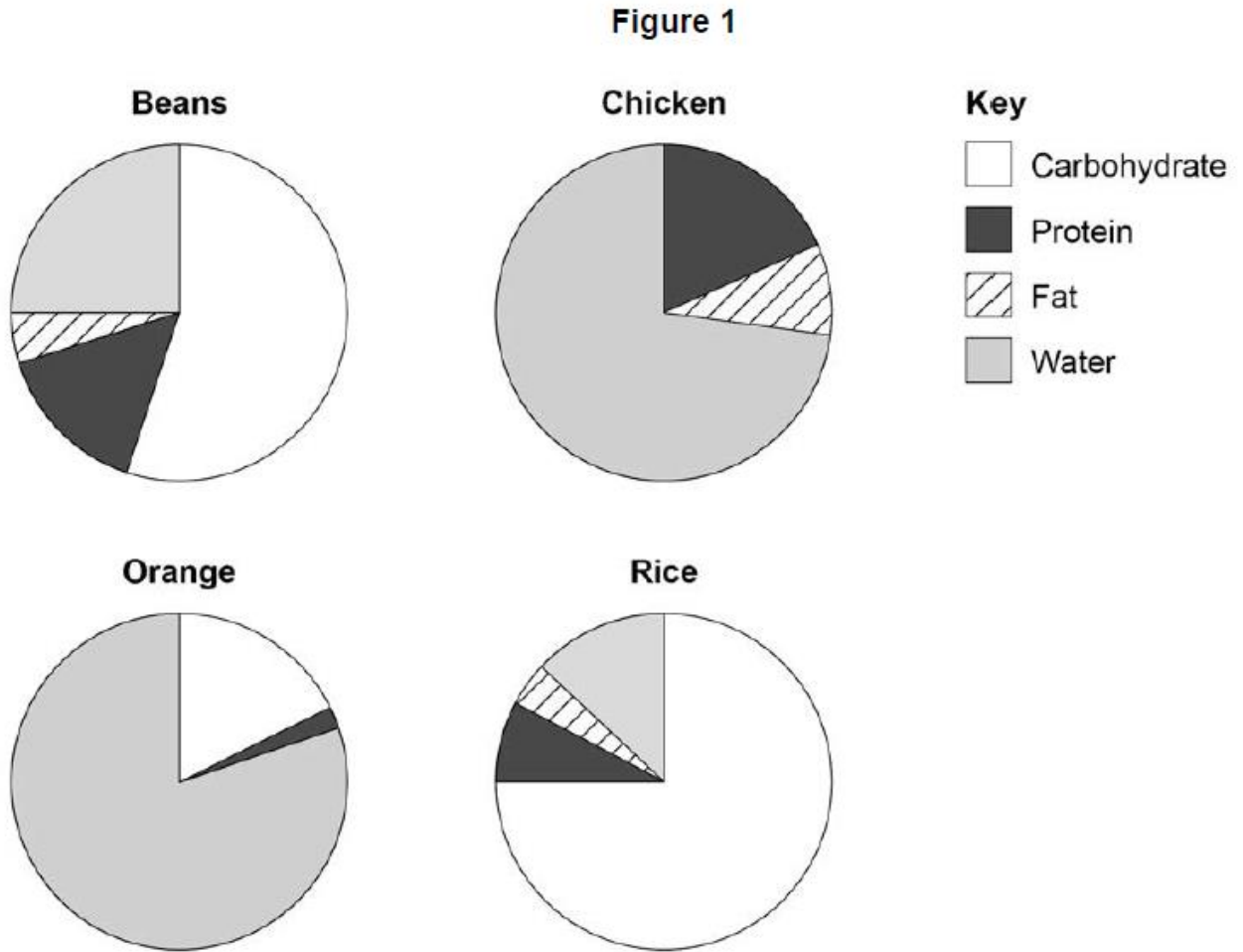
Describe the effects of liver failure on the human body.

[4 marks]

6. May/2019/Paper_1F/No.1

Many foods contain carbohydrates.

Figure 1 shows information about four different foods.



0 1 . 1 Which food contains the highest percentage of carbohydrate?

[1 mark]

Tick (✓) **one** box.

- Beans
- Chicken
- Orange
- Rice

0 1 . 2 Estimate the percentage of water found in beans.

[1 mark]

Percentage = _____ %

0 1 . 3 Look at **Figure 1**.

Why would eating only beans provide a more balanced diet than eating only chicken?

[1 mark]

0 1 . 4 Sugars are produced when enzymes break down starch.

What is the name of the enzyme which breaks down starch to produce sugars?

[1 mark]

Tick (✓) **one** box.

Amylase

Bile

Lipase

Protease

0 1 . 5 Which chemical could be used to test for glucose?

[1 mark]

Tick (✓) **one** box.

Benedict's reagent

Biuret reagent

Iodine solution

Sulfuric acid

0 1 . 6 What colour change would be seen in a positive test for glucose?

[1 mark]

From blue to _____.

0 1 . 7 People with diabetes have difficulty controlling the concentration of glucose in their blood.

The blood of four people was tested.

Table 1 shows the results.

Table 1

Person	Concentration of glucose in blood in arbitrary units
A	4.2
B	6.9
C	7.1
D	5.1

Table 2 shows the information used to help decide if a person has diabetes.

Table 2

Concentration of glucose in blood in arbitrary units	Conclusion
<5.6	No diabetes
5.6 to 7.0	Mild diabetes
>7.0	Severe diabetes

Which person has severe diabetes?

[1 mark]

Tick (✓) **one** box.

A

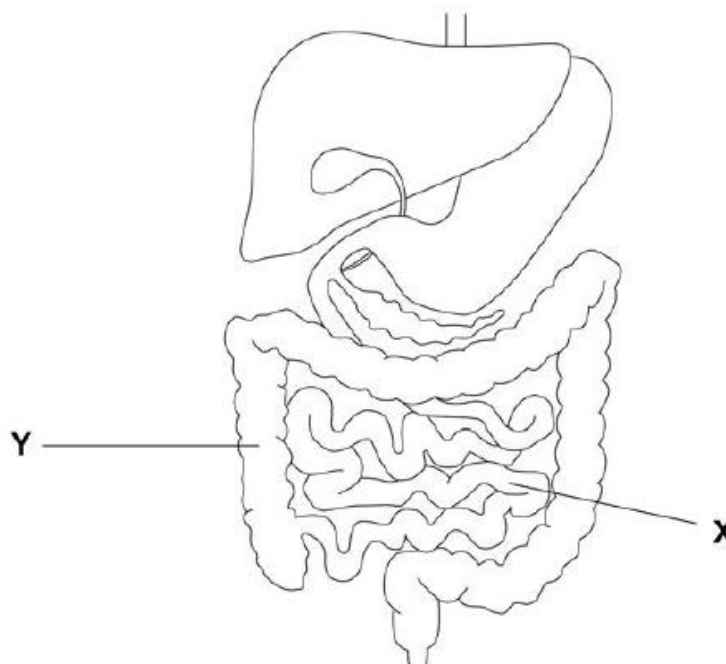
 B

 C

 D

Figure 2 shows part of the human digestive system.

Figure 2



0 1 . 8 Glucose is absorbed into the bloodstream in part X.

Name part X.

[1 mark]

0 1 . 9 Complete the sentences.

[2 marks]

Choose answers from the box.

active transport	digestion	excretion
osmosis	respiration	

Some glucose is absorbed into the bloodstream against the concentration gradient by the process of _____.

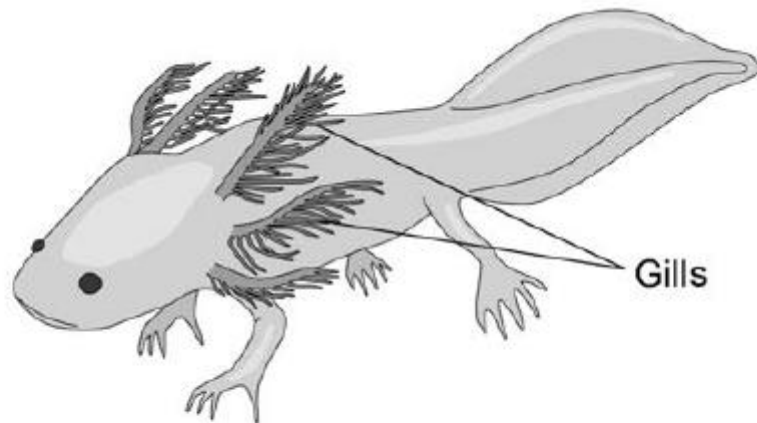
Water moves out of part Y and into the bloodstream by the process of _____.

7. May/2019/Paper_1F/No.2

An animal called an axolotl lives in water.

Figure 3 shows an axolotl.

Figure 3



Oxygen enters the axolotl's bloodstream through the gills by diffusion.

0 2 . 1 What is diffusion?

[1 mark]

Tick (✓) **one** box.

The movement of particles from a high concentration to a low concentration

The movement of particles from a low concentration to a high concentration

The movement of water from a concentrated solution to a more dilute solution

0 2 . 2 Describe how **one** feature of the axolotl's gills increases the rate of diffusion of oxygen.Use information from **Figure 3**.

[2 marks]

Feature _____

Description _____

If a gill of an axolotl is removed, stem cells in the damaged area will divide and a new gill will grow.

0 2 . 3 Complete the sentence.

[1 mark]

Choose the answer from the box.

adaptation

differentiation

evolution

variation

When stem cells specialise to produce gill cells, this process is

known as _____.

0 2 . 4 Complete the sentence.

[1 mark]

Choose the answer from the box.

binary fission

mitosis

mutation

To grow a new gill the stem cells divide by _____.

0 2 . 5 Which **one** of the following does **not** contain stem cells?

[1 mark]

Tick (✓) **one** box.

Bone marrow

Embryos

Hair

Meristem tissue

0 2 . 6 Axolotls are small animals. Axolotls are used in stem cell research.

What are **two** advantages of using axolotls in stem cell research?

[2 marks]

Tick (✓) **two** boxes.

Axolotls are cheap to feed.

Axolotls are easy to breed.

Axolotls are endangered.

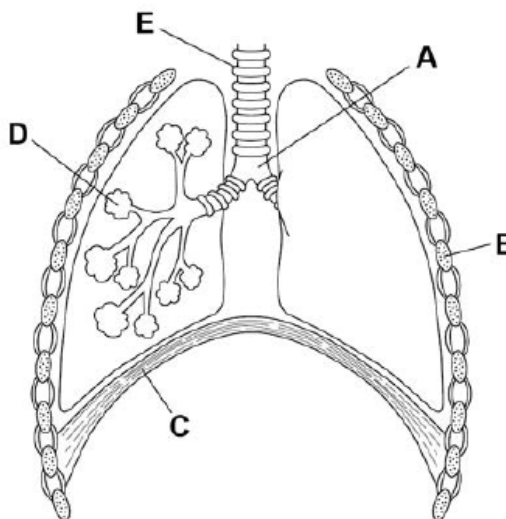
Axolotls live in water.

Axolotl research is cruel.

Oxygen uptake in humans takes place in the lungs.

Figure 4 shows the human breathing system.

Figure 4



0 2 . 7 Where does oxygen enter the bloodstream?

[1 mark]

Tick (✓) one box.

A B C D

0 2 . 8 Name part E on Figure 4.

[1 mark]

0 2 . 9 Which blood vessel carries blood to the lungs?

[1 mark]

Tick (✓) one box.

Aorta

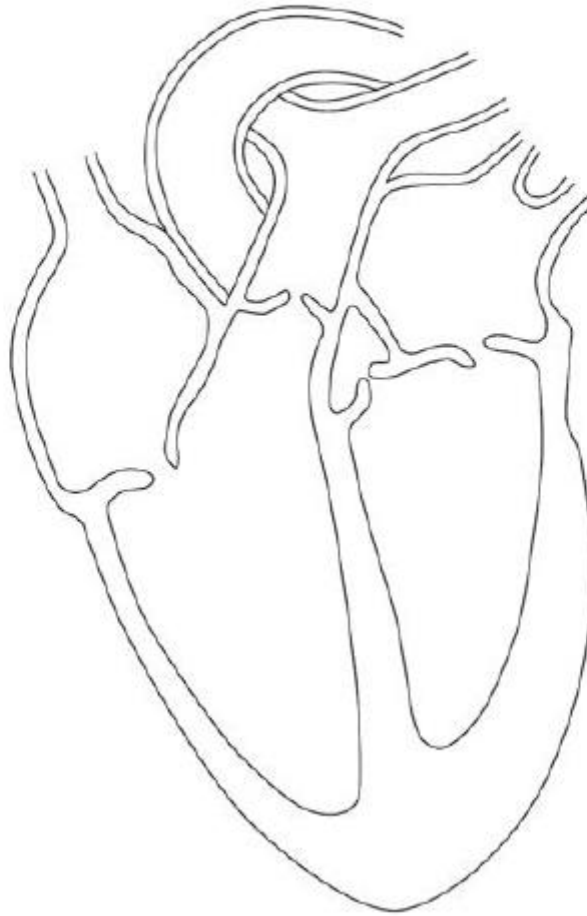
Pulmonary artery

Vena cava

8. May/2019/Paper_1F/No.6

Figure 11 shows the internal structure of the human heart.

Figure 11



0 6 . 1 Which organ system is the heart a part of?

[1 mark]

0 6 . 2 Draw a ring around **one** valve on **Figure 11**.

[1 mark]

0 6 . 3 What is the function of the valves in the heart?

[1 mark]

06.4 Valves are also found inside some blood vessels.

Which type of blood vessel contains valves?

[1 mark]

Sometimes a valve in the heart can begin to leak.

A leaking heart valve may be replaced with either:

- a mechanical valve
- a biological valve from a pig.

Table 6 shows information about the replacement valves.

Table 6

Mechanical valve	Biological valve from a pig
Made of plastic or metal	Made from living tissue
Can cause the blood to clot around the valve	No risk of blood clotting around the valve
No need for another replacement valve after 5 years	Sometimes another replacement valve is needed after 5 years

06.5 Suggest **two** reasons why a patient may choose a mechanical valve and **not** a biological valve from a pig.

[2 marks]

1 _____

2 _____

06.6

Suggest **one** reason why a patient may choose a biological valve from a pig and **not** a mechanical valve.

[1 mark]

06.7

A person may develop other medical conditions.

Draw **one** line from each medical condition to the correct treatment.

[2 marks]

Medical condition

Treatment

High blood cholesterol

Antibiotics

Artificial pacemaker

Irregular heart rate

Insulin

Statins

9. May/2019/Paper_1F/No.5

A man has the following symptoms:

- yellow discharge from his penis
- pain when urinating.

0 5 . 1 The man has a bacterial infection.

What is the most likely cause of the man's symptoms?

[1 mark]

Tick (✓) **one** box.

- | | |
|----------------------|--------------------------|
| Gonorrhoea | <input type="checkbox"/> |
| HIV | <input type="checkbox"/> |
| Measles | <input type="checkbox"/> |
| Salmonella poisoning | <input type="checkbox"/> |

0 5 . 2 The man took a full course of antibiotics.

The man's symptoms did **not** improve.

Why did the antibiotics **not** cure the symptoms?

[1 mark]

Tick (✓) **one** box.

- | | |
|--|--------------------------|
| The bacteria are immune to the antibiotics. | <input type="checkbox"/> |
| The bacteria are resistant to the antibiotics. | <input type="checkbox"/> |
| The man is immune to the antibiotics. | <input type="checkbox"/> |
| The man is resistant to the antibiotics. | <input type="checkbox"/> |

0	5	.	3
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Using a condom can stop the bacteria being passed to another person during sexual intercourse.

Suggest a different way the man could avoid passing the bacteria on to someone else.

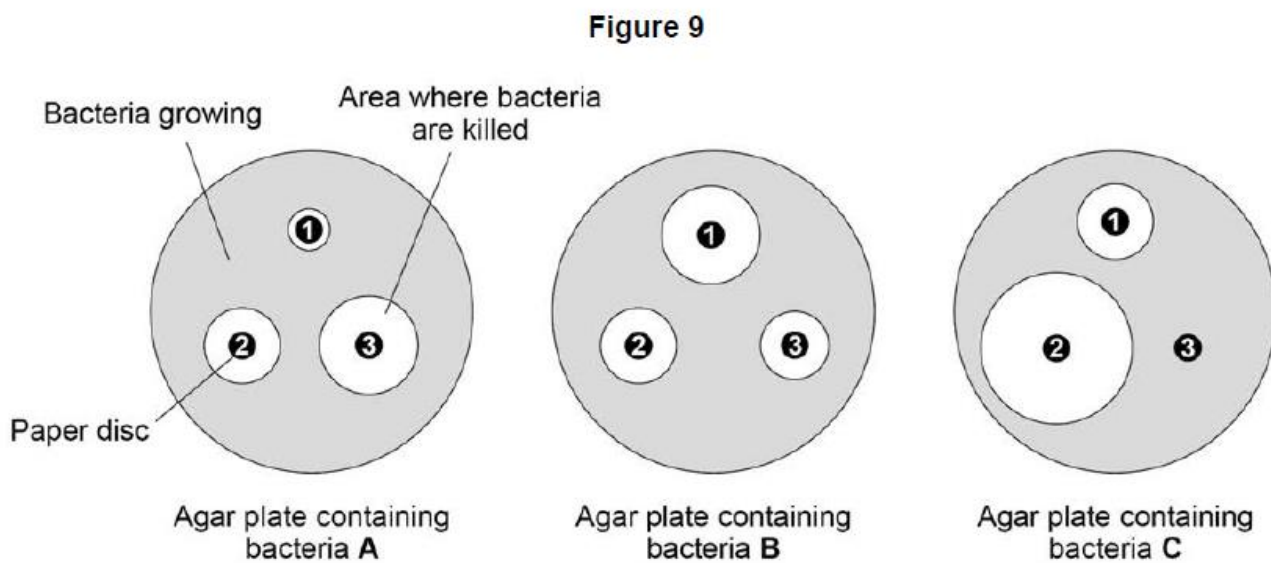
[1 mark]

A scientist investigated the effect of three different antibiotics on three different types of bacteria, **A**, **B** and **C**.

This is the method used.

1. Grow bacteria **A** on an agar plate.
2. Put three separate paper discs each containing one of the antibiotics (1, 2 and 3) onto the agar plate.
3. Put the agar plate into an incubator for 48 hours.
4. Repeat steps 1–3 for bacteria **B** and for bacteria **C**.

Figure 9 shows the scientist's results.



0 5 . 4

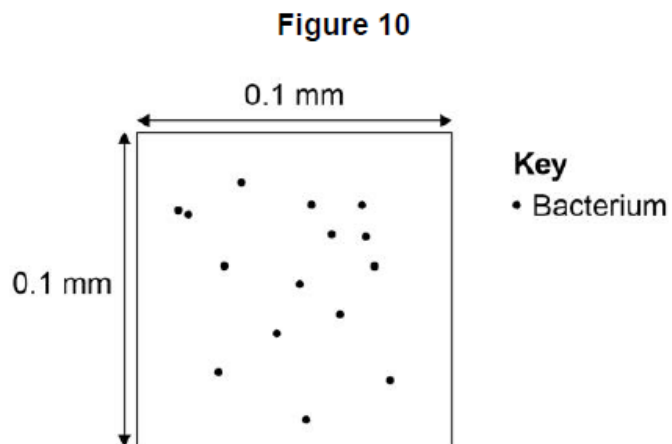
Compare the effectiveness of the three antibiotics at killing the different types of bacteria.

[6 marks]

Milk contains bacteria.

A small volume of raw milk was placed in a counting chamber in a special type of microscope slide.

Figure 10 shows what the counting chamber looked like when viewed using a microscope.



A scientist counted the number of bacteria in four samples of raw milk.

Table 4 shows the results.

Table 4

Milk sample	Number of bacteria in counting chamber
E	15
F	12
G	13
H	16

0 5 . 5 Which milk sample is shown in **Figure 10**?

[1 mark]

Tick (✓) **one** box.

Sample **E**

Sample **F**

Sample **G**

Sample **H**

0 5 . 6 Calculate the mean number of bacteria in the four samples in **Table 4**.

[2 marks]

Mean number of bacteria = _____

0 5 . 7 Calculate the mean number of bacteria per mm^3 of milk in the samples.

Complete the following steps.

[3 marks]

Calculate the total area of the counting chamber in **Figure 10**.

Total area of counting chamber = _____ mm^2

The depth of the counting chamber is 0.01 mm

Calculate the volume of the counting chamber in **Figure 10**.

Use the equation:

$$\text{volume} = \text{area} \times \text{depth}$$

Volume of counting chamber = _____ mm^3

Calculate the mean number of bacteria per mm^3 of milk in the samples.

Use the equation:

$$\text{mean number of bacteria per mm}^3 \text{ of milk} = \frac{\text{mean number of bacteria from Question 05.6}}{\text{volume of counting chamber}}$$

Mean number of bacteria per mm^3 of milk = _____

Milk is heated to reduce the number of bacteria it contains before it is sold for humans to drink.

Milk with more than 20 000 bacteria per cm^3 cannot be sold for humans to drink.

Table 5 shows the number of bacteria per cm^3 in four different samples of milk.

Table 5

Milk sample	Number of bacteria per cm^3 of milk
P	1.8×10^4
Q	2.2×10^4
R	2.2×10^{-5}
S	1.8×10^3

0 5 . 8 Which of the milk samples could **not** be sold for humans to drink?

[1 mark]

Tick (✓) **one** box.

P Q R S

0 5 . 9 Why should milk sold for humans to drink **not** contain large numbers of bacteria?

[1 mark]
