

AQA – Bioenergetics – GCSE Biology Paper 1

1. June/2021/Paper_1F/No.2

0	2
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 Viruses cause disease.

0	2	.	1
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 What name is given to microorganisms that cause disease?**[1 mark]**Tick (✓) **one** box.

Pathogens

Predators

Prokaryotes

0	2	.	2
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 How do viruses cause the symptoms of disease?**[1 mark]**Tick (✓) **one** box.

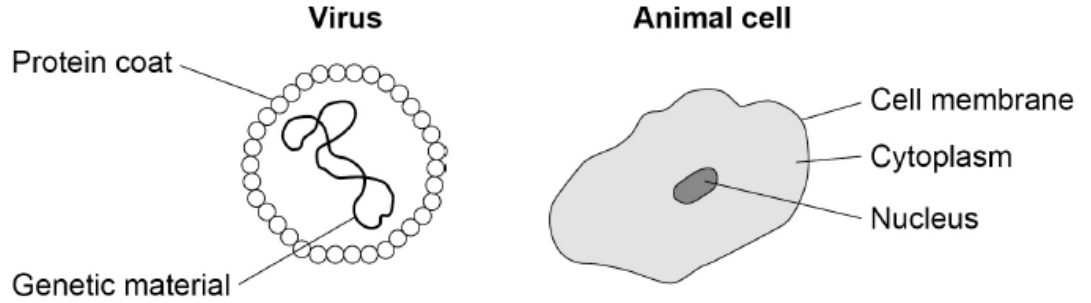
Viruses engulf white blood cells, destroying them.

Viruses produce antibodies that damage tissues.

Viruses reproduce inside cells, damaging them.

Figure 4 shows a virus and an animal cell.

Figure 4



Not to scale

0 2 . 3

Suggest **one** reason why viruses are **not** classed as cells.

[1 mark]

A vaccine can protect humans from a viral disease.

0 2 . 4

What does the vaccine contain?

[1 mark]

Tick (✓) **one** box.

A toxic form of a virus

A weakened form of a virus

An active form of a virus

In some cases, a first vaccination needs to be followed by a second vaccination some time later.

0 2 . 5

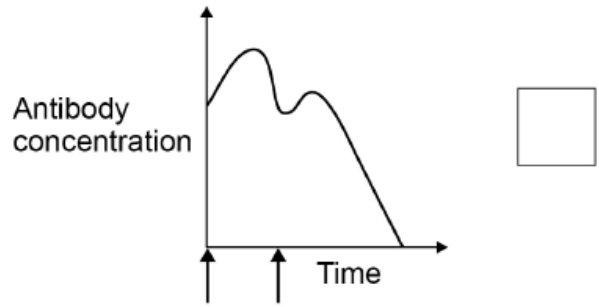
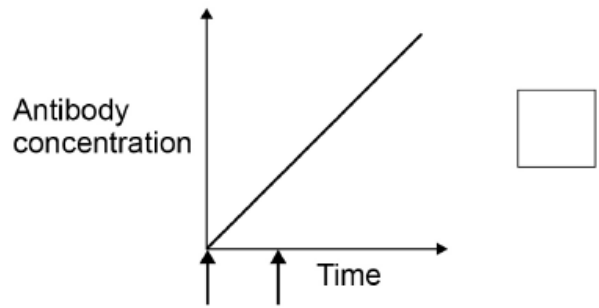
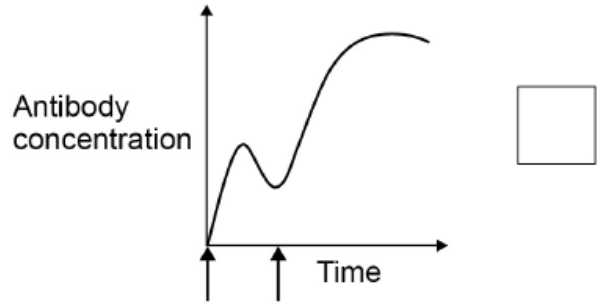
Which graph shows how the concentration of antibodies in a person's blood changes after the first and second vaccinations?

[1 mark]

Tick (✓) **one** box.

Key

↑ Vaccination given



Tobacco mosaic virus (TMV) causes disease in plants.

TMV affects the rate of photosynthesis in plants.

0 2 . 6 Which part of a plant shows discolouration caused by TMV?

[1 mark]

Tick (✓) **one** box.

Flower

Leaf

Root

Table 1 shows the rate of photosynthesis in four different tobacco plants.

Table 1

Tobacco plant	Level of TMV infection in plant	Rate of photosynthesis in arbitrary units
A	None	15
B	Mild	13
C	Medium	7
D	High	3

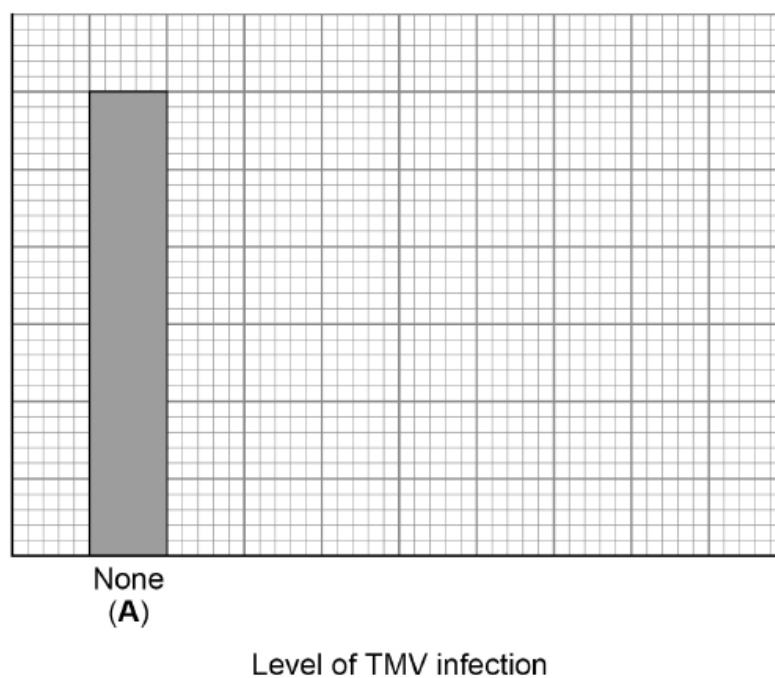
0 2 . 7 Complete **Figure 5**.

You should:

- label the y-axis
- add the correct scale to the y-axis
- plot the data from **Table 1**
- label each bar.

[5 marks]

Figure 5



0 2 . 8

What conclusion can be made from the data in **Table 1**?

[1 mark]

0 2 . 9

Explain why a high level of TMV infection reduces growth in a plant.

[2 marks]

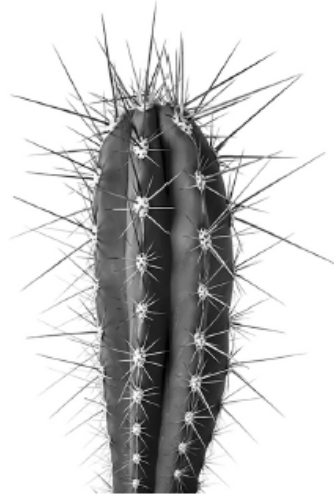
2. June/2021/Paper_1F/No.3

0 3

A cactus is a plant that lives in a dry environment.

Figure 6 shows part of a cactus plant.

Figure 6



0 3 . 1

Give **one** adaptation shown in **Figure 6** that helps to prevent the cactus from being eaten by animals.

[1 mark]

0 3 . 2

A plant may produce poisons that make animals unwell.

What is this type of defence mechanism?

[1 mark]

Tick (✓) **one** box.

Chemical

Mechanical

Physical

0 3 . 3 Some desert plants only grow leaves after it has rained.

As soon as the soil dries out, the leaves fall off.

How could the leaves falling off the plant be an advantage to a plant that lives in a dry environment?

[1 mark]

Tick (✓) **one** box.

The plant is less likely to reproduce.

The plant will not lose as much water.

The plant will photosynthesise faster.

The stem of a cactus is green.

0 3 . 4 What causes the green colour in the stem?

[1 mark]

0 3 . 5 What is the advantage to the cactus of having a green stem?

[1 mark]

The stem of a cactus contains many different tissues.

0 3 . 6 What name is given to a group of tissues working together?

[1 mark]

Tick (✓) **one** box.

Organ

Organism

Organ system

0 3 . 7 Name **one** substance transported through the xylem in the stem of the cactus.

[1 mark]

0 3 . 8 Name the tissue that transports dissolved sugars through the stem of the cactus.

[1 mark]

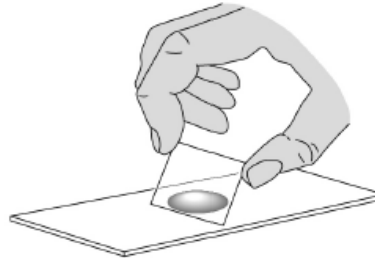
3. June/2021/Paper_1H/No.1

0 1

A student prepared some animal cells to view using a microscope.

Figure 1 shows the student preparing the cells.

Figure 1



0 1 . 1

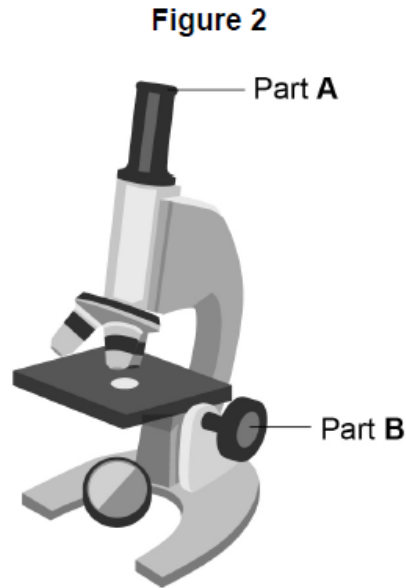
Name **two** pieces of laboratory equipment the student could have used to prepare cells to view using a microscope.

[2 marks]

1 _____

2 _____

Figure 2 shows the student's light microscope.



0 1 . 2 Name part A.

[1 mark]

0 1 . 3 What is the function of part B?

[1 mark]

0 1 . 4 The student tried to look at the cells using the microscope.

Suggest **one** reason why the student could **not** see any cells when looking through part A.

[1 mark]

0 1 . 5 Red blood cells are specialised animal cells.

Compare the structure of a red blood cell with the structure of a plant cell.

[6 marks]

0 1 . 6 When placed into a beaker of water:

- a red blood cell bursts
- a plant cell does **not** burst.

Explain why the red blood cell bursts but the plant cell does **not** burst.

[2 marks]

4. June/2021/Paper_1H/No.3

0 3

Body Mass Index (BMI) is a way of finding out if a person's body mass falls within a healthy range for their height.

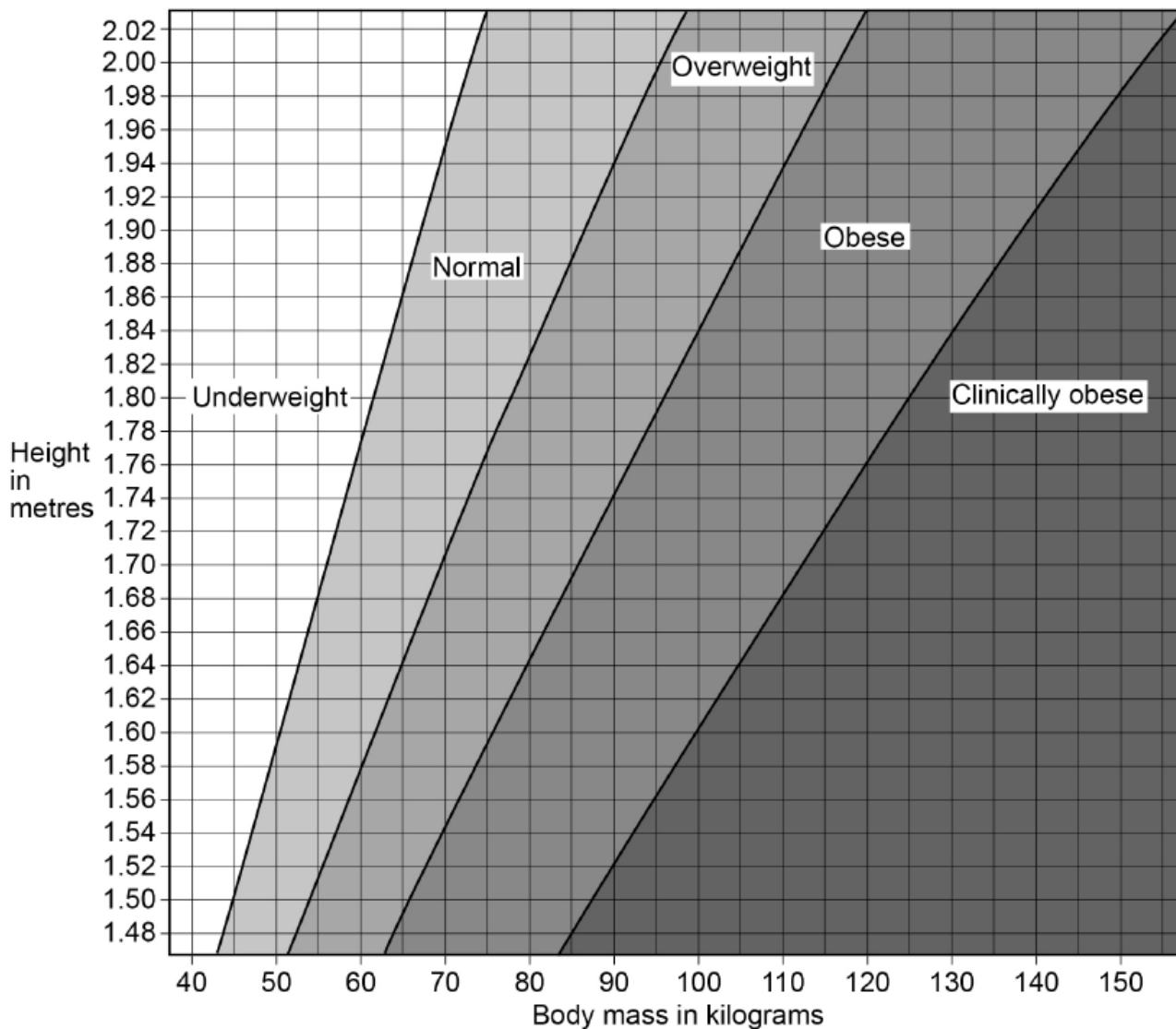
Table 1 shows information about two people.

Table 1

Person	Body mass in kg	Height in m	BMI in kg/m ²
A	63	1.65	23.1
B	92	1.71	X

Figure 5 shows five BMI categories for adults.

Figure 5



0 3 . 1 Which is the BMI category of person **A** in **Table 1**?

[1 mark]

Tick (✓) **one** box.

Clinically obese

Normal

Obese

Overweight

Underweight

0 3 . 2 Calculate value **X** in **Table 1**.

Use the equation:

$$\text{BMI} = \frac{\text{body mass}}{\text{height}^2}$$

Give your answer to 3 significant figures.

[3 marks]

X = _____ kg/m²

Scientists think there is a link between BMI and life expectancy.

Table 2 shows information about predicted life expectancy of men after the age of 50.

Table 2

BMI Category	Predicted number of years living in good health after the age of 50	Predicted number of years living in bad health after the age of 50
Normal	19.06	4.98
Overweight	18.68	5.32
Obese	16.37	7.08
Clinically obese	13.07	10.10

0 3 . 3 Describe **two** patterns shown in **Table 2** about the effects of BMI category.

[2 marks]

1 _____

2 _____

The number of people who are obese in the UK is increasing.

0 3 . 4 Explain the financial impact on the UK economy of an increasing number of people who are obese.

[2 marks]

0 3 . 5 A person who is obese is more at risk of arthritis.

Arthritis is a condition that damages joints.

Suggest how arthritis could affect a person's lifestyle.

[1 mark]

0 3 . 6 A person who eats a diet high in saturated fat might become obese.

Name **two** health conditions that might develop if a person eats a diet high in saturated fat.

Do **not** refer to arthritis in your answer.

[2 marks]

1 _____

2 _____