Collins

AQA

GCSE

Biology

F

SET A – Paper 1 Foundation Tier

Author: Mike Smith

Materials

Time allowed: 1 hour 45 minutes

For this paper you must have:

- a ruler
- a calculator.

Instructions

- Answer **all** questions in the spaces provided.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- There are 100 marks available on this paper.
- The marks for questions are shown in brackets.
- You are expected to use a calculator where appropriate.
- You are reminded of the need for good English and clear presentation in your answers.
- When answering questions 05.3, 10.3 and 12.3 you need to make sure that your answer:
  – is clear, logical, sensibly structured
  – fully meets the requirements of the question
  – shows that each separate point or step supports the overall answer

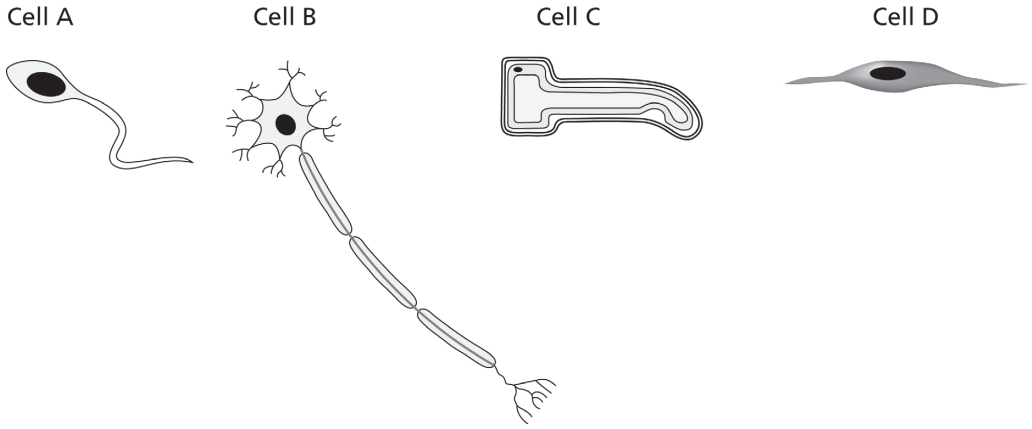
Advice

- In all calculations, show clearly how you work out your answer.

Name: .....

01 **Figure 1.1** shows four types of cell.

Figure 1.1



01.1 Which cell is a nerve cell?

Give **one** reason for your answer.

Cell .....

Reason ..... **[2 marks]**

01.2 Which cell is a root hair cell?

Give **one** reason for your answer.

Cell .....

Reason ..... **[2 marks]**

01.3 Which cell is a sperm cell?

Give **one** reason for your answer.

Cell .....

Reason ..... **[2 marks]**

01.4 Which cell comes from a plant?

Give **one** reason for your answer.

Cell .....

Reason ..... **[2 marks]**

02 Plants make glucose when they photosynthesise.

02.1 Which of the following is **not** used for photosynthesis?

Tick **one** box.

- Carbon dioxide ☐
- Light ☐
- Oxygen ☐
- Water ☐

[1 mark]

02.2 Where does most photosynthesis take place in a plant?

Tick **one** box.

- Epidermal tissue ☐
- Palisade mesophyll ☐
- Phloem ☐
- Xylem ☐

[1 mark]

02.3 What is the chemical symbol for glucose?

Tick **one** box.

- $C_6H_6O_{12}$ ☐
- $C_6H_{12}O_6$ ☐
- $C_{12}H_6O_6$ ☐
- $C_{12}H_6O_{12}$ ☐

[1 mark]

Question 2 continues on the next page

02.4 Plants can convert glucose to other substances.

Draw **one** line from each substance to its use.

Substance made from glucose	Use
Amino acids	Food storage
Cellulose	Protein synthesis
Starch	Strengthen cell walls

[2 marks]

02.5 Some of the glucose made in photosynthesis is converted to other sugars.

Use words from the box to complete the sentences.

active transport	**osmosis**	**phloem**
spongy mesophyll	**translocation**	**xylem**

Sugars are transported from the leaves to other parts of the plant through the

..... .

This movement of sugars is called ..... . **[2 marks]**

02.6 At which time of day do plants photosynthesise most?

Tick **one** box.

- Midnight ☐
- Early morning ☐
- Midday ☐
- Early evening ☐

Give **two** reasons for your answer.

1. .....

2. ..... **[3 marks]**

03 The blood system is made of different parts.

03.1 Draw **one** line from each part of the blood to its function.

Part of the blood	Function
Plasma	Form blood clots
Platelets	Protect the body against infection
White blood cells	Carry dissolved food and other substances around the body

[2 marks]

03.2 Some illnesses can cause the number of white blood cells to decrease.

Why is it dangerous if the number of white blood cells decreases?

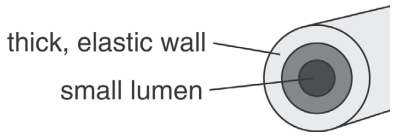
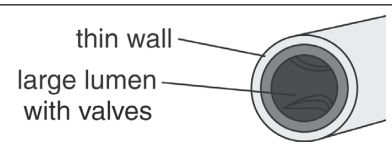
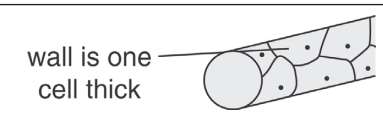
.....

[1 mark]

03.3 There are different types of blood vessel.

Draw **one** line from each blood vessel to its structure.

The diagrams are **not** to scale.

Blood vessel	Structure
Artery	
Capillary	
Vein	

[2 marks]

Question 3 continues on the next page

03.4 In coronary heart disease there is **reduced** blood flow to the heart muscle.

Explain why it is dangerous if there is **reduced** blood flow to the heart muscle.

.....

.....

..... **[2 marks]**

03.5 Treatments for coronary heart disease include the following:

Artificial heart	Drug treatment	Replacement heart valve	Stent

A patient has suffered heart failure, but no suitable donor is available.

Which of these treatments should the patient have?

Explain your answer.

Treatment .....

Reason .....

..... **[2 marks]**

04 Malaria is a disease caused by a single-celled pathogen called *Plasmodium*.

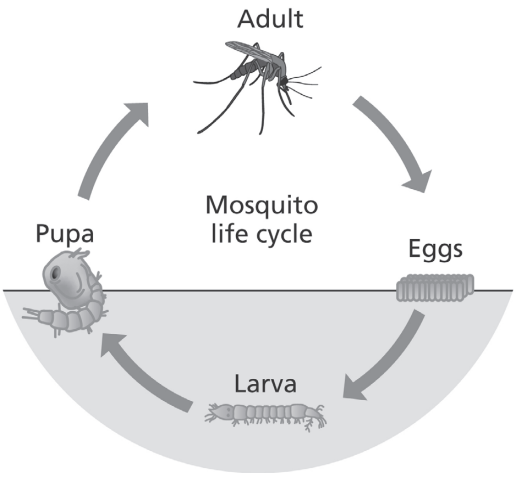
Mosquitoes take in *Plasmodium* when they feed on an infected person.

They can then pass on *Plasmodium* to the next person they feed on.

04.1 **Figure 4.1** shows the life cycle of mosquitoes.

Mosquitoes lay their eggs in still water.

Figure 4.1



Suggest how **both** of the following help control the spread of malaria.

Spraying still water with oil to cover the surface.

.....

.....

Wearing long sleeves and long trousers.

.....

..... **[2 marks]**

Question 4 continues on the next page

04.2 A type of mosquito that can spread malaria lives in the UK.

However, malaria is rare in the UK.

Suggest why these mosquitoes do **not** usually spread malaria in the UK.

.....

.....

..... **[2 marks]**

04.3 Other diseases are caused by different types of pathogen.

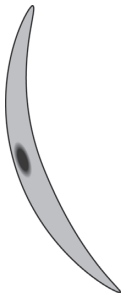
Draw **one** line from each disease to the type of pathogen that causes it.

Disease	Type of pathogen
Measles	Bacterial
Rose black spot	Fungal
Salmonella food poisoning	Viral

[2 marks]

04.4 **Figure 4.2** shows a *Plasmodium* cell.

Figure 4.2



Plasmodium is a protist.

It is bigger than a bacterial cell.

Give **two other** ways it is different from a bacterial cell.

1. .....

2. ..... **[2 marks]**

05 Many medical drugs were originally extracted from plants and microorganisms.

05.1 Draw **one** line from each drug to the organism that originally produced it.

Drug	Organism
Aspirin	Foxglove plant
Digitalis	*Penicillium* mould
Penicillin	Willow tree

[2 marks]

05.2 Today most new drugs are made by chemists.

Suggest **two** reasons why most new drugs today are made by chemists and **not** extracted from organisms like plants.

1. .....

.....

2. .....

..... **[2 marks]**

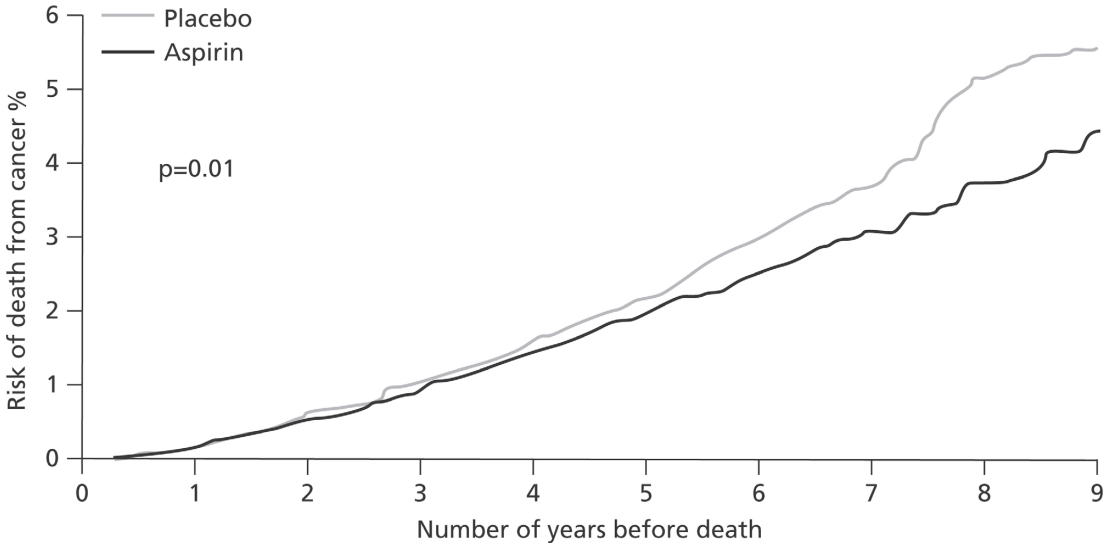
Question 5 continues on the next page

05.3 Doctors investigated whether taking aspirin affects the risk of getting cancer.

Volunteers taking part in the study took a daily dose of aspirin or a placebo.

Figure 5.1 shows the results.

Figure 5.1



Use **Figure 5.1** to **describe** the effect of taking aspirin on the risk of dying from cancer.

[4 marks]

06 Yeast is used in the production of alcoholic drinks.

Yeast converts glucose to ethanol (alcohol) during anaerobic respiration.

06.1 What is another word for anaerobic respiration in yeast?

Tick **one** box.

Differentiation ☐

Diffusion ☐

Fermentation ☐

Ventilation ☐

[1 mark]

06.2 **Figure 6.1** shows a container used to make beer.

Figure 6.1

The airlock prevents any gases entering the container.

Suggest why this is necessary.

.....

.....

..... **[2 marks]**

Question 6 continues on the next page

06.3 The airlock does allow gases to leave the container.

Suggest why this is necessary.

.....

.....

..... **[2 marks]**

06.4 Write the word equation for anaerobic respiration in **human muscles**.

..... **[2 marks]**

06.5 Humans do **not** just use anaerobic respiration.

They mainly use aerobic respiration.

Give **one** reason why humans do **not** just use anaerobic respiration.

.....

..... **[1 mark]**

07 Bacteria multiply by cell division.

07.1 Bacteria can divide every 20 minutes.

If you start with one bacterial cell, how many cells will there be after 1 hour?

Tick **one** box.

2 ☐

4 ☐

6 ☐

8 ☐

[1 mark]

07.2 A student grew bacterial colonies on an agar plate using the following method.

1. Pass an inoculating loop through a Bunsen flame.

2. Let the loop cool.

3. Dip the loop in a bacterial culture.

4. Slightly lift the lid off an agar plate.

5. Use the loop to spread some of the bacterial culture over the agar.

6. Pass the loop through the Bunsen flame again.

7. Seal the lid of the agar plate with adhesive tape, but **not** all the way round.

8. Store the agar plate upside down.

9. Incubate the agar plate at 25°C

Explain the reasons for steps 1, 2, 8 and 9

Reason for step 1 .....

.....

Reason for step 2 .....

.....

Reason for step 8 .....

.....

Reason for step 9 .....

..... **[4 marks]**

Question 7 continues on the next page

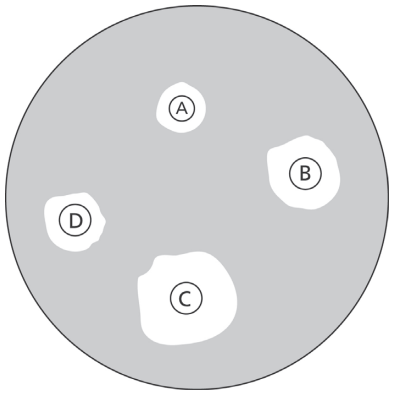
07.3 Another student spread a bacterial culture evenly over an agar plate.

Four filter paper discs, A–D, were impregnated with different antibiotics.

The four paper discs were placed on the agar plate before it was incubated.

Figure 7.1 shows the results. The shaded area shows where bacteria are present.

Figure 7.1



Which antibiotic is the most effective at preventing the growth of the bacteria?

Give a reason for your answer.

Antibiotic .....

Reason .....

..... **[2 marks]**

07.4 The student needed to measure the diameter of each clear zone to work out its area.

For each clear zone, the student took several measurements of the diameter.

Explain why this was necessary.

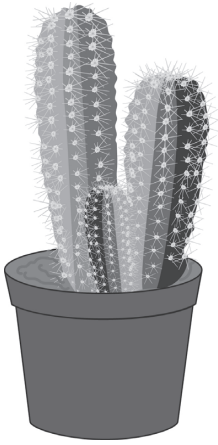
.....

.....

..... **[2 marks]**

08 **Figure 8.1** shows a cactus plant.

Figure 8.1



08.1 Some cactus plants have spines and a thick waxy coating on the stem.

These adaptations help to conserve water.

Explain **one other** way that **each** of these adaptations help cactus plants survive.

Spines .....

.....

Waxy coating .....

..... **[4 marks]**

08.2 As well as water, cactus plants also need mineral ions, like magnesium.

How will a cactus be affected if it does **not** have enough magnesium?

Explain your answer.

.....

.....

..... **[2 marks]**

Turn over >

09 Scientists made a new trachea for a patient whose own had been damaged by cancer.

They grew the new trachea using stem cells from the patient's own bone marrow.

09.1 Use words from the box to complete the sentences.

abnormal	**benign**	**genetic**
malignant	**tissues**	

Cancer tumours are formed by uncontrolled cell growth.

Tumours that spread to other parts of the body are called ..... .

Tumours that stay in one area are called ..... . **[2 marks]**

09.2 What is the function of the trachea?

.....

..... **[1 mark]**

09.3 What are stem cells?

.....

.....

..... **[2 marks]**

09.4 The scientists used stem cells from bone marrow.

Some people have objections to using some other types of stem cell.

Explain why they have objections.

.....

.....

..... **[1 mark]**

09.5 Suggest **one** benefit of using the patient's **own** stem cells.

.....

..... **[1 mark]**

10 Many diseases can be treated with medicines.

10.1 The common cold is caused by a virus.

Doctors give medicines like aspirin to patients with a cold.

Doctors do **not** give antibiotics to patients with a cold.

Explain why patients with a cold should take a medicine like aspirin.

.....

.....

Explain why patients with a cold should **not** take antibiotics.

.....

..... **[2 marks]**

10.2 New medicines have to be tested in clinical trials before they can be used for the general public.

Give **two** reasons why new drugs have to be tested.

1. .....

.....

2. .....

..... **[2 marks]**

Question 10 continues on the next page

10.3 Some clinical trials of new medicines use healthy volunteers, and some use ill patients.

Many clinical trials involve the use of placebos.

Should you use placebos with both healthy volunteers and ill patients?

Explain your answer.

[4 marks]

10.4 Some clinical trials are double blind trials.

Why are double blind trials used?

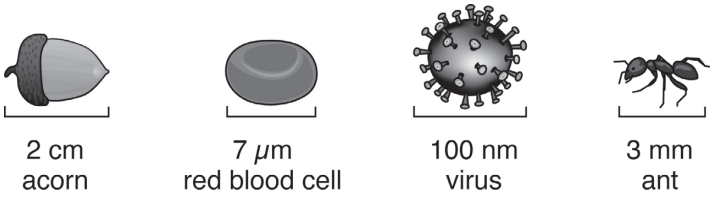
[1 mark]

11 Microscopes can be used to study very small structures.

11.1 **Figure 11.1** shows some structures of different sizes.

The diagrams are **not** to scale.

Figure 11.1



Write the objects in order of their size, from the smallest to the largest.

Smallest .....

.....

.....

Largest ..... **[2 marks]**

Question 11 continues on the next page

11.2 **Figure 11.2** shows an image of a white blood cell.

Figure 11.2

The actual size of the cell is 12 μm

The diameter of the image is 60 mm

Calculate the magnification of the image.

Use the formula:

$$\text{magnification} = \frac{\text{size of image}}{\text{size of real object}}$$

Magnification: ..... **[3 marks]**

11.3 When using a microscope to view cells:

- often a stain is used
- the cells are first viewed using low power.

Explain the reason for each of these.

Reason for using a stain: .....

.....

Reason for viewing first with low power: .....

..... **[2 marks]**

12 **Figure 12.1** shows the apparatus that a student used to investigate transpiration.

Figure 12.1

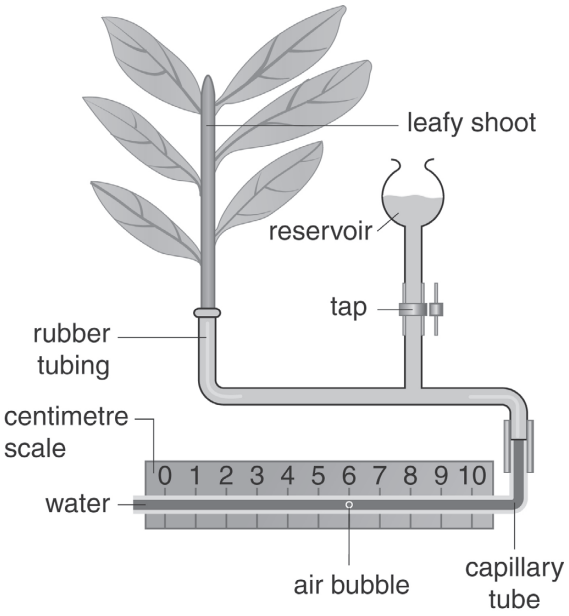


Table 12.1 shows the student's results.

Table 12.1

Time in min	Distance air bubble moved in mm
0	0
5	18
10	25
15	54
20	72

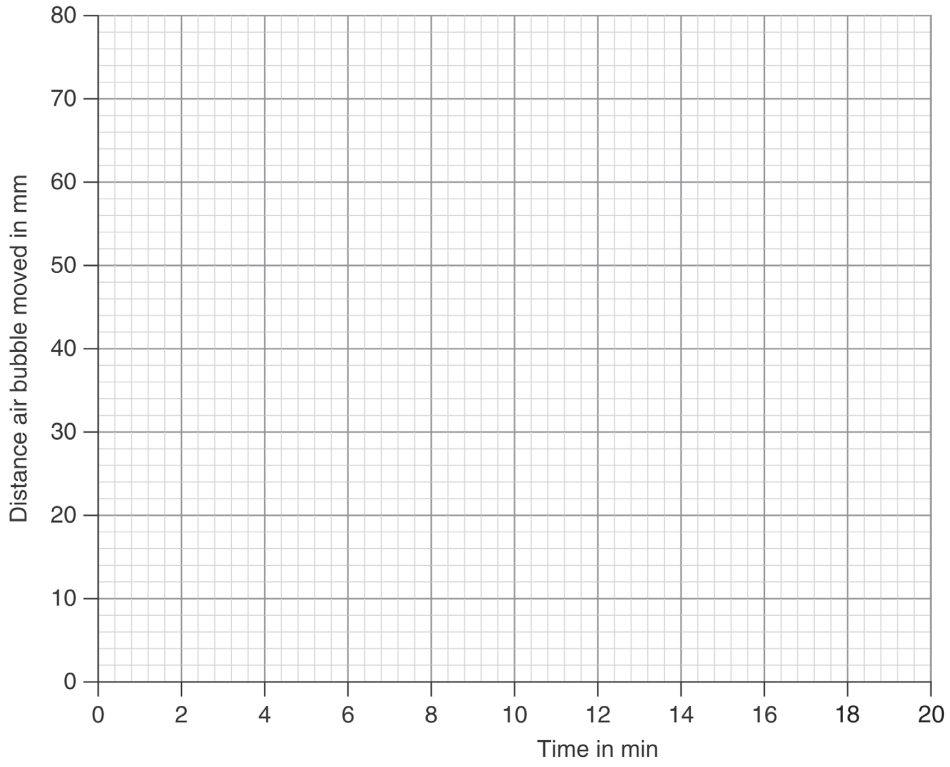
Question 12 continues on the next page

12.1 Plot the data from **Table 12.1** onto **Figure 12.2**

Circle any anomalous results.

Draw a line of best fit.

Figure 12.2



[4 marks]

12.2 Explain why transpiration caused the air bubble to move.

.....

.....

[1 mark]

12.3 The rate of transpiration is affected by air movement.

Describe a method you could use to investigate this.

Include the apparatus shown in **Figure 12.1**, plus an electric fan to produce air movement.

You should include:

- what you would measure
- variables you would control.

[6 marks]

END OF QUESTIONS

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