1. Glucose is often found in the urine of people who have diabetes.

Benedict's solution is used to detect glucose in the urine.

It is also used to give a measure of the concentration of glucose in a sample.

Describe how the results of the Benedict's test can give a measure of the concentration of glucose in a sample.

[3]

2. Plant hormones control many processes in plants.

Complete these sentences by writing the correct plant hormones in the gaps.

Each hormone can be used more than once.

Flowers are sometimes sprayed with ..... to produce fruits without seeds.

After fruits are picked, they can be exposed to ..... to make them ripen.

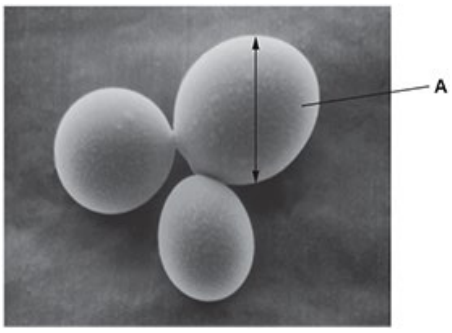
Flowers are stimulated to open, and seeds made to break dormancy by the hormone ..... .

Selective weedkillers and rooting powders usually contain ..... .

[4]

3(a). Yeast is a fungus.

The image is of some yeast cells taken using an electron microscope.



The actual diameter of the yeast cell labelled **A** is 2.8 μm.

(1 mm = 1000 μm)

Calculate the magnification used to produce this image.

Give your answer to **3** significant figures.

Magnification = ... **[4]**

(b). The cells in the image are baker's yeast.

Baker's yeast is used to make bread. The yeast respires anaerobically.

Which product of this process will help the bread rise?

_____ **[1]**

4. Which substance in urine does the biuret test identify?

A Glucose
B Ions
C Protein
D Red blood cells

Your answer ☐ **[1]**

5. Two students are discussing respiration.

One student says, 'I know all animals respire but I don't think plants need to.'

Explain why the student's statement is **not** correct.

_____ **[2]**

6. In a keto diet, people eat foods that consist mainly of proteins and lipids.

What will they lack in their diet?

A Amino acids, fatty acids and glucose
B Glucose
C Glucose and fatty acids
D Glycerol and amino acids

Your answer ☐ **[1]**

7. Which molecules are all polymers?

A DNA, amino acids and starch
B Fatty acids, glycerol and amino acids
C RNA, glucose and fatty acids
D Starch, protein and DNA

Your answer ☐ **[1]**

8. Mole rats are rodents that live in Africa. Mole rats spend most of their life burrowing underground in tunnels. Some tunnels have only 5% oxygen in the air compared with 21% above ground.

Scientists have found that the mole rats have several unusual features compared to other rodents.

The mole rats have:

- a very low respiration rate
- haemoglobin that binds to oxygen more easily
- very few pain receptors that respond to acid build up in their body.

Explain how these features would help the mole rats survive in the tunnels.

[6]

9. Hypothyroidism occurs when the body has an underactive thyroid gland.

Hypothyroidism can also change the way the body processes fat.

- This can cause high cholesterol levels that lead to deposits of cholesterol in the coronary artery.
- The coronary artery supplies blood to the cardiac muscle.

Suggest why cholesterol deposits could affect the correct functioning of the heart.

[2]

10(a).

i. Cellular respiration is an important biological process.

Describe what is meant by the term cellular respiration.

[2]

ii. Cells can use glucose, lipid or protein as respiratory substrates.

The respiratory substrates being used can be found using this ratio:

$$\frac{\text{volume of carbon dioxide produced}}{\text{volume of oxygen consumed}}$$

The table gives the ratio for three single respiratory substrates.

Substrate	Ratio
Glucose	1.0
Lipid	0.7
Protein	0.8

The ratio calculated from investigations often indicates that more than one respiratory substrate is being used at the same time.

In an investigation, these measurements were recorded.

- volume of oxygen consumed = 120 cm^3
- volume of carbon dioxide produced = 108 cm^3

Calculate the ratio and suggest which respiratory substrates were being used.

Ratio = _____

Respiratory substrates used _____ **[2]**

(b).

i. Describe **one** biochemical test that can be used to test for the presence of glucose.

_____

_____

_____

[2]

ii. Suggest how this test could be used to compare how much glucose is present in two different tissues.

_____

_____

[1]

END OF QUESTION PAPER