

Candidate Name

Candidate Number

Centre Name

Centre Number

Paper 1:

Sample Paper

(2 hours)

It is necessary to respond on the answer sheets provided alongside this question paper. Additionally, you must have a soft pencil (preferably of type B or HB), a clean eraser and a dark blue or black pen.

INSTRUCTIONS:

- You must write your name, candidate number, centre name and centre number on the answer sheets in the designated spaces.
- Objective section consists of 25 questions, and it is essential that you attempt all of them.
- Each question has four options labelled A, B, C, and D. Select the option that you think is correct. Mark it on the multiple-choice answer sheet using a soft pencil.
- Attempt all the questions from subjective section using a dark blue or black pen.
- It is important to follow the instructions provided on the answer sheets.
- Do not use correction fluid.
- Avoid writing on any bar codes.

INFORMATION:

- This paper has a total of 100 marks.
- In objective section there are 25 questions, each carries one mark. There is no negative marking for incorrect responses.
- In subjective section, 45 marks are for extended theory and 30 marks for practical component.
- The number of marks assigned for every question or its parts is indicated within brackets [].

OBJECTIVE SECTION:

[Total 25 marks]

1) Photosynthesis is a chemical reaction that occurs in plants to produce glucose and oxygen. The release of oxygen from a plant is an example of which life process?

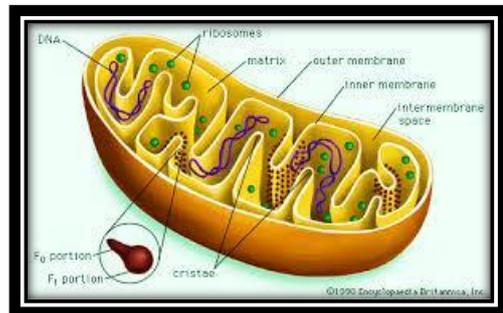
- A – Respiration
- B- Nutrition
- C- Excretion
- D – Growth

2) Carbon dioxide is a product of a respiration, which chemical test could be carried out to indicate the presence of carbon dioxide.

- A – Universal Indicator
- B – Iodine
- C – Methyl blue
- D – Limewater

3) What is the function of organelle pictured below:

- A – Site of photosynthesis
- B- Site of protein synthesis
- C – Site of aerobic respiration.
- D- Site of starch storage.



4) Which row represents the correct structures found in cells:

	Animal	Plant	Fungi	Bacteria
A	Glycogen store	Chloroplast	Glycogen store	Mitochondria
B	Cell membrane	Glycogen store	Cell membrane	Cell wall
C	Nucleus	Starch Granule	Mitochondria	Chloroplasts
D	Mitochondria	Cell Wall	Glycogen store	Ribosomes

5) Viruses are referred to as acellular, when measuring actual size of viruses which unit is most appropriate.

A – μm

B – nm

C – mm

D – pm

6) Which row is correct for the representative elements in proteins:

	Carbon	Hydrogen	Oxygen	Nitrogen	Sulphur
A	Yes	Yes	Yes	No	Sometimes
B	Yes	Yes	Yes	Yes	Sometimes
C	Sometimes	Yes	Yes	Yes	Sometimes
D	Yes	Yes	Yes	Sometimes	Yes

7) A DNA nucleotide can be described as a

A – Polymer

B – Monomer

C – Double helix

D – Single strand

8) What is the complimentary base sequence of DNA for the following:

TACCTCGTACGA

A – ATGGAGCATGCA

B – ATAGAGCATGCA

C – ATGGAGCATCCA

D - ATGGACCATGCA

9) Which of the following is correct for chemical digestion of lipids by action of lipase?

- A – Lipids → amino acids + glycerol
- B – Lipids → fatty acids + fat globules
- C – Lipids → fatty acids + glycerol
- D – Lipids → fat globules + glycerol

10) Which one of the following is not a function of enzymes?

- A – Enzymes can break large molecules into smaller ones.
- B – Enzymes can bind to complimentary receptors cell membranes.
- C – Enzymes can build large molecules from smaller ones.
- D – Enzymes can convert one small molecule into another.

11) Which chemical test is used to identify the presence of vitamin C

- A – Iodine solution
- B – Benedict's solution
- C – Biuret solution
- D – DCPIP solution

12) Describe the role of fibre in a balanced diet.

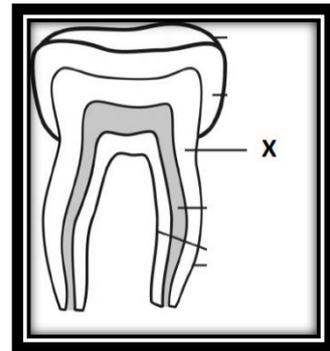
- A – Growth and repair
- B – Aids peristalsis
- C – Regulate the body's metabolism
- D – Provision of energy

13) Nutrient deficiencies can cause a range of conditions, which condition is associated with a lack of calcium in the diet.

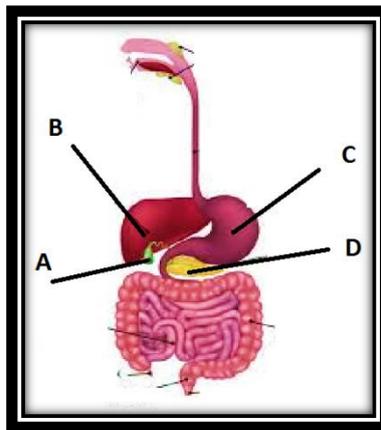
- A – Rickets
- B – Scurvy
- C – Kwashiorkor
- D – Anaemia

14) What is the structure X?

- A – Pulp
- B – Enamel
- C – Dentin
- D – Cementum



15) Which letter from diagram shows where is amylase produced in the body?

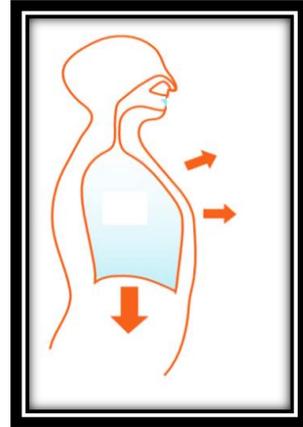


16) The condition celiac disease which reduces the surface area of the villi in the small intestine, celiac is an example of what kind of disease

- A – Autoimmune disease
- B – Deficiency disease
- C – Caused by a pathogen
- D – Caused due to an intolerance of lactose.

17) Which process is being represented in the diagram below:

- A – Inhalation
- B – Ventilation
- C – Exhalation
- D – Diffusion



18) Which sequence correctly represents the pathway of oxygen to red blood cells:

- A – Larynx > bronchi > alveoli > bronchioles > red blood cells
- B – Trachea > bronchi > alveoli > bronchioles > red blood cells
- C – Larynx > trachea > bronchioles > alveoli > red blood cells
- D – Larynx > bronchi > trachea > alveoli > red blood cells

19) What is the name of the main blood vessel that delivers deoxygenated blood from the body to the heart?

- A – Aorta
- B – Pulmonary vein
- C – Vena Cava
- D – Pulmonary artery

20) Which component of the blood has approximately 45% composition?

- A – Red blood cells
- B – Plasma
- C – White blood cells
- D – Platelets

21) Vaccination is provides

- A – Passive immunity
- B – Active immunity
- C – Natural immunity
- D – Artificial immunity

22) Rose black spot is a disease that affects plants, it is caused by which type of pathogen?

- A – Virus
- B- Bacteria
- C – Fungus
- D – Protoctist

23) Chlorosis is a plant deficiency disease caused by a lack of which mineral

- A – Nitrates
- B – Phosphates
- C – Potassium
- D – Magnesium

24) Describe how antibiotics are used to help treat bacterial diseases

- A – Destroys bacterial DNA
- B – Damages cell membrane
- C- Inhibits cell wall formation
- D - Stop mitosis

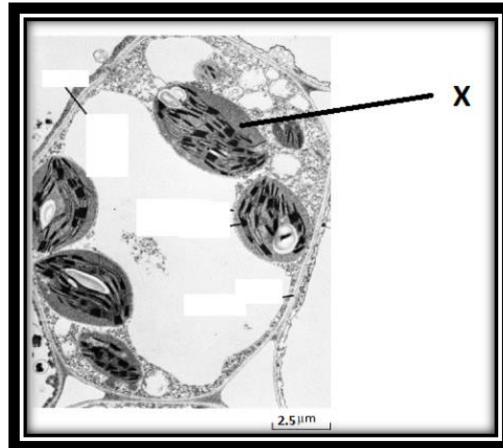
25) Which one of the following statements is correct?

- A – First stage of drug development involves testing on animals
- B – Third stage of drug development involves computer modelling
- C – Second stage of drug development involves clinical trials
- D – Third stage of drug development involves clinical trials.

EXTENDED THEORY:

[Total 45 marks]

Q1)



(Needs to be an electron micrograph image of a palisade cell, with the chloroplast clearly labelled X) Scale bar of 2.5μm is needed also. Need to ensure scale bar is 1cm in length.

- Name structure X and describe its function? [2]
- What piece of equipment was used to take the image above and explain your answer? [3]
- Using the scale bar calculate the magnification of this image? [3]

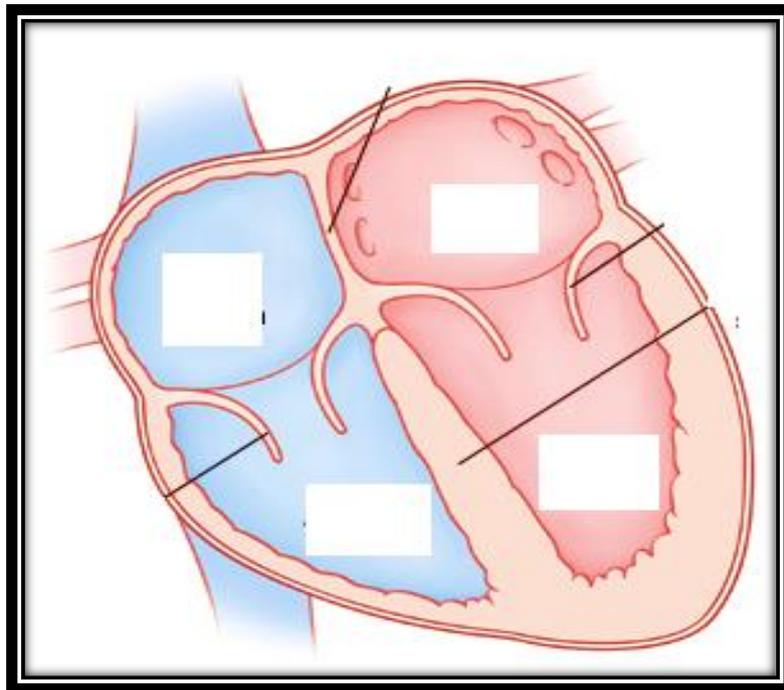
[Total 8 marks]

Q2) Oxygen is present in the Earth's atmosphere at a relative concentration of 20-22%, it is an essential reactant in aerobic respiration which releases energy which is essential for an organism's survival.

- Write the balanced chemical equation aerobic respiration? [2]
- State 2 uses of energy in the organisms? [2]
- Explain how an oxygen debt can occur in the body and how it is repaid? [6]

[Total 10 marks]

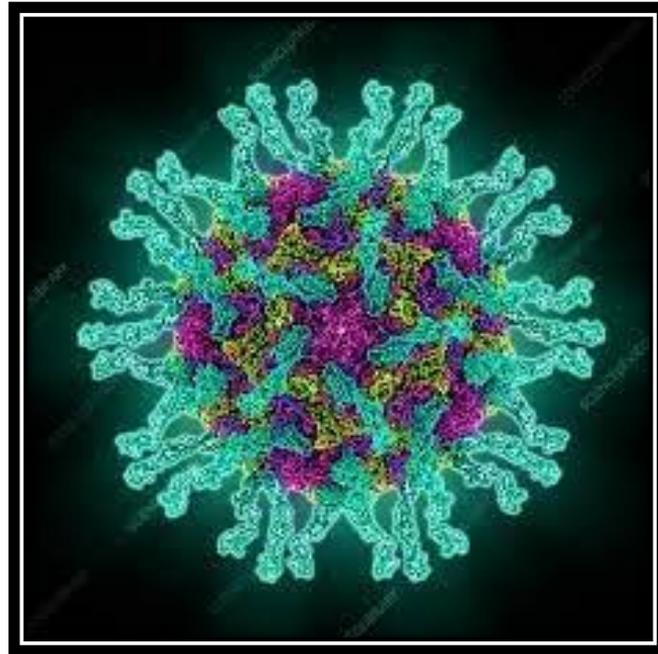
Q3) Heart is the main organ in the circulatory system.



- a) What is meant by the term organ? [1]
- b) On the image above using a label line indicate the location of the pacemaker? [1]
- c) Describe the pathway and actions of the heart, for blood to travel from lungs to body? [4]
- d) A genetic birth defect can lead to a hole in the septum, describe and explain the effect of this on the child? [3]
- e) Older men are more likely to suffer with coronary heart disease, a condition that can cause a heart attack followed by death if left untreated. Describe and explain treatments for coronary heart disease [6]

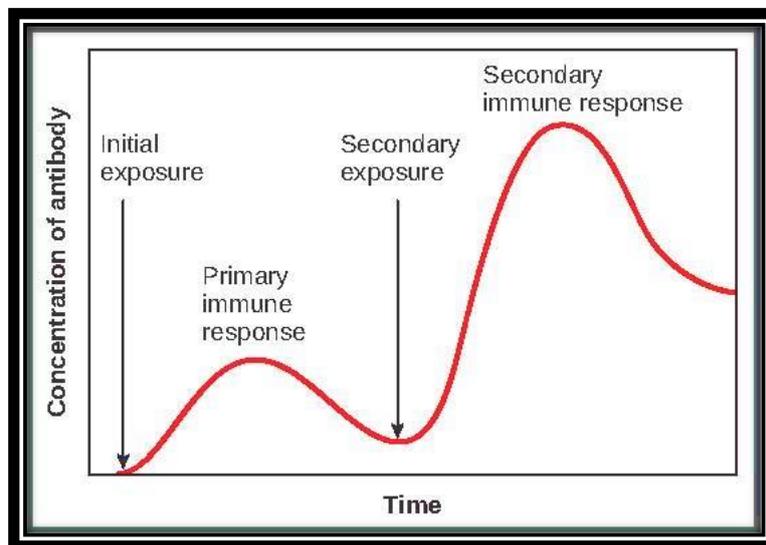
[Total 15 marks]

Q4) Pathogens are microorganisms that can cause infectious diseases, Polio virus has been eradicated from modern society due to vaccination.



a) Name a structure found in viruses but not bacteria? [1]

b) Describe the process of vaccination? [1]



c) Describe and explain the primary immune response and secondary immune response? [3]

d) Describe the role of antibodies in immunity [4]

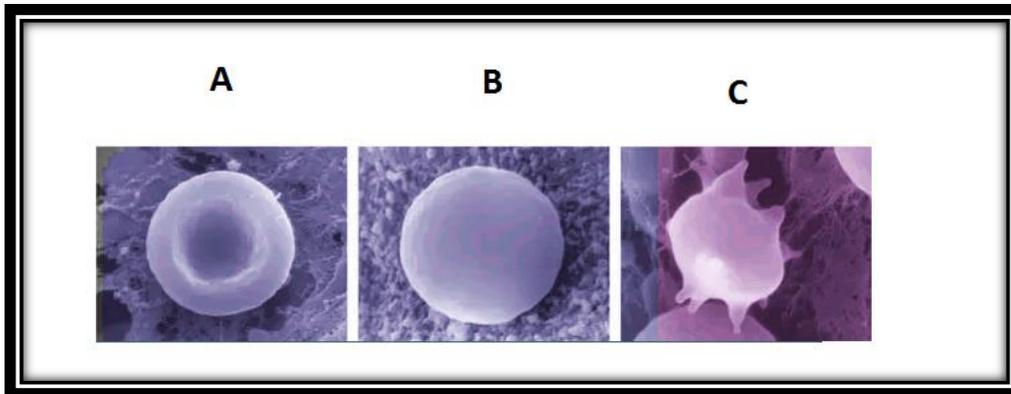
e) Explain how individuals may get chicken pox twice? [3]

[Total 12 marks]

PRACTICAL COMPONENT:

[Total 30 marks]

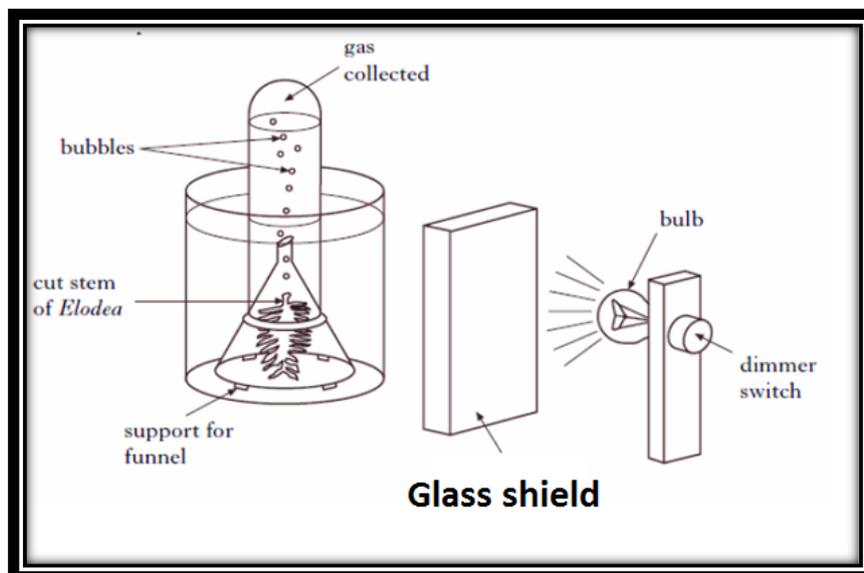
Q1) A student wanted to investigate the effect of osmosis on red blood cells, the student placed 3 red blood cells in different solutions A, B and C observed the results.



- Which solution was an isotonic solution? Justify your choice. [4]
- Design a suitable investigation for the effect of different concentration of salt solution in potato sticks [6]

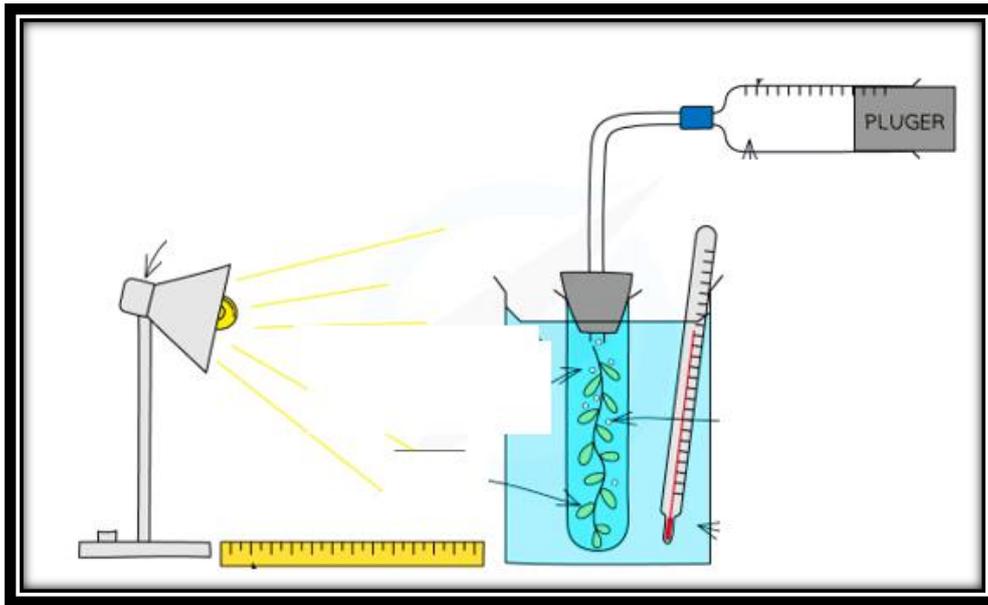
[Total 10 marks]

Q2) Students investigated the effect of temperature on the rate of photosynthesis. The students set up their experiment as show below:



- What is the dependent variable of this investigation? [1]
- What is the purpose of the glass shield? [1]

The students decided to modify his experiment to the image shown below.



c) Evaluate the two experiments and suggest reasons for the modification? [3]

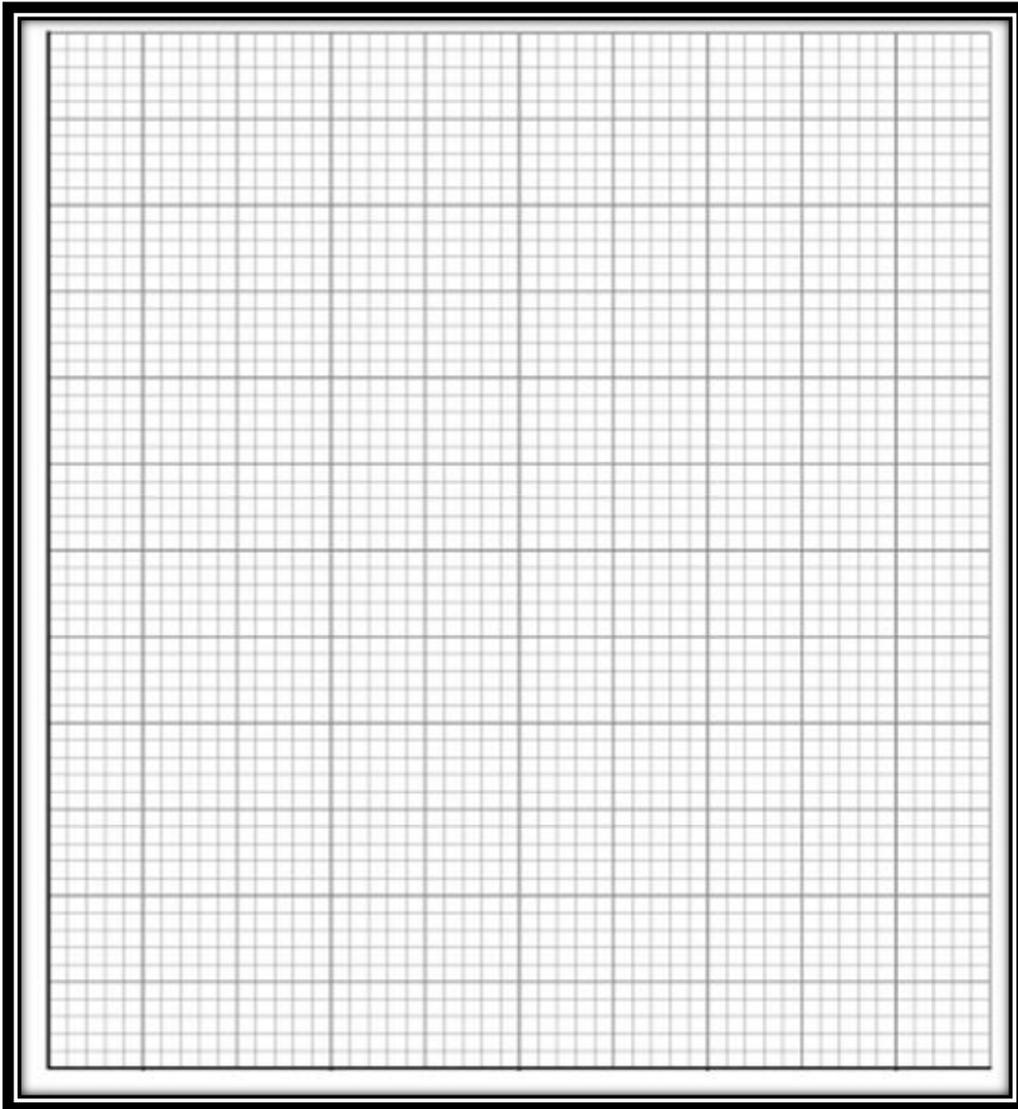
Table 1 below shows the results:

Temperature °C	Rate of photosynthesis/ cm ³ per hour			
	Repeat 1	Repeat 2	Repeat 3	Mean
0	2.2 cm ³	2.8 cm ³	2.5 cm ³	2.5 cm ³
10	16.5 cm ³	17 cm ³	16.6 cm ³	16.7 cm ³
20	25.0 cm ³	26.4 cm ³	26.3 cm ³	25.9 cm ³
30	45.2 cm ³	43.4 cm ³	44.3 cm ³	Z
40	20.0 cm ³	22.1 cm ³	21.5 cm ³	21.2 cm ³
50	0.1 cm ³	0.0 cm ³	0.2 cm ³	0.1 cm ³

d) Identify the error the students have made in representing their data? [1]

e) Calculate the value of Z? [2]

f) Draw a line graph to represent Table 1 [5]



g) Describe the observed results? [3]

h) Explain the results observed at the temperature of 0°C? [2]

i) Suggest a further change that could be done to improve the accuracy of this experiment to identify the optimum temperature for photosynthesis? [2]

[Total 20 marks]