	Class	Register Number
Name:		

DUNEARN SECONDARY SCHOOL
PRELIMINARY EXAMINATION 2021
Science (Biology) 5107
Secondary 4 Normal Academic
Paper 5

13 August 2021 (Friday) **0815 – 0930** **Paper 5 & 6: 1 h 15 min**

INSTRUCTIONS TO CANDIDATES

Additional materials: Multiple Choice answer sheet

READ THESE INSTRUCTIONS FIRST

Write in soft pencil.
Do not use staples, paper clips, highlighters, glue or correction fluid.
Write your name, class and register number on the answer sheet in the spaces provided unless this has already been done for you.

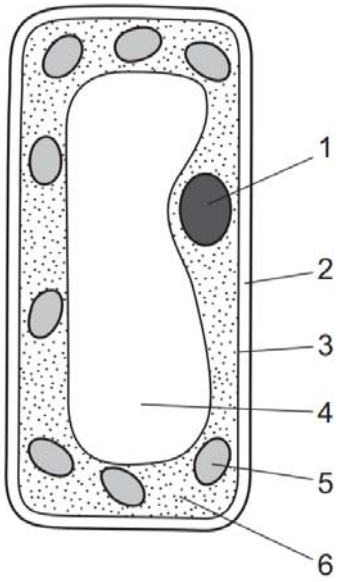
There are **twenty** questions in this paper. Answer **all** questions.
For each question, there are four possible answers, **A**, **B**, **C** and **D**. Choose the **one** you consider correct and record your choice in **soft pencil** on the OTAS sheet provided.

Read very carefully the instructions on the answer sheet.

Answers to Paper 5 and Paper 6 must be handed in separately.
Each correct answer will score one mark. A mark will not be deducted for a wrong answer.
You are advised not to spend more than **30 minutes** on **Paper 5**.
You may proceed to answer Paper 6 as soon as you have completed Paper 5.
Any rough working should be done in this paper.

Setter: Mr Ng Hock Ping

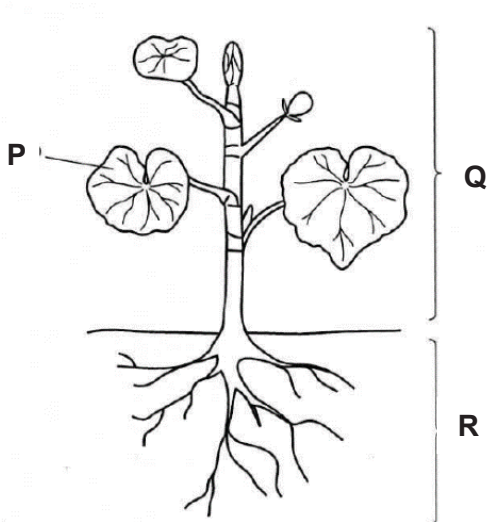
1 The diagram shows a palisade mesophyll cell from a leaf.
The features of the cell are numbered.



Which features are found **only** in plant cells?

A 1, 2 and 3
B 1, 5 and 6
C 2, 4 and 5
D 3, 4 and 6

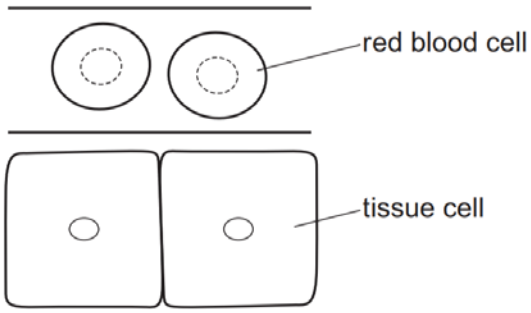
2 The diagram shows a plant.



Which correctly identifies **P**, **Q** and **R**?

	P	Q	R
A	organ	organ	organ
B	organ	organ system	organ system
C	organ system	organ	tissue
D	organ system	organ system	tissue

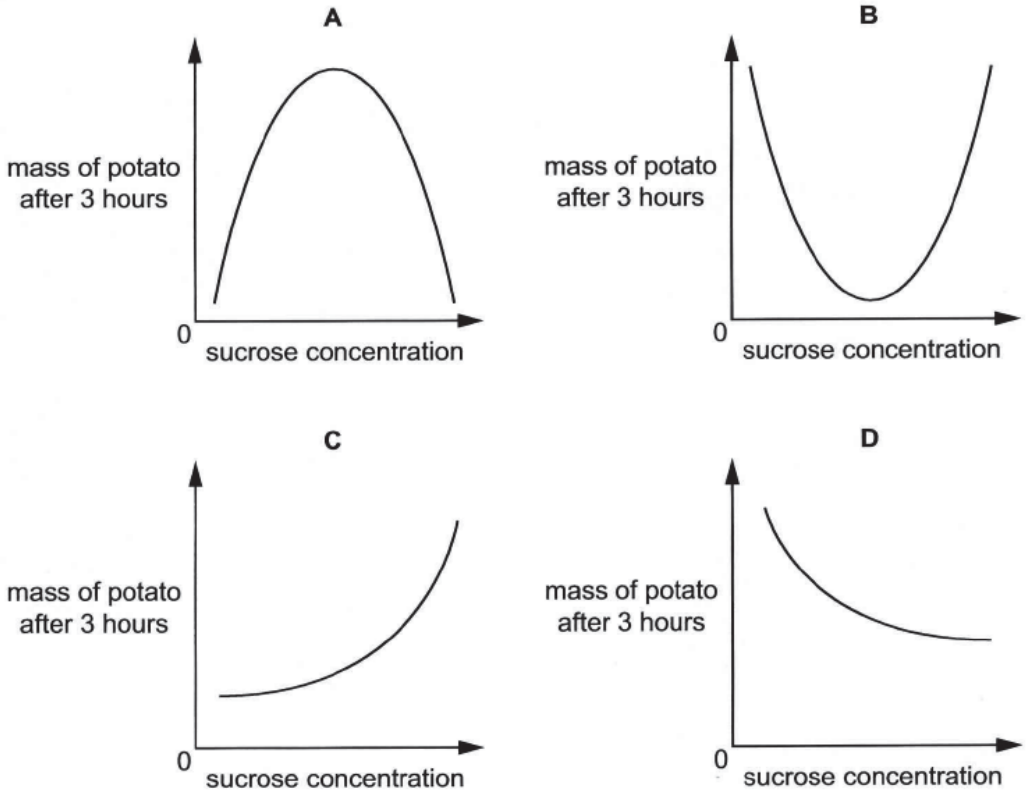
3 The diagram shows two red blood cells inside a capillary and two tissue cells near this capillary.



How does the oxygen in the red blood cells reach the tissue cells?

A by absorption
B by diffusion
C by respiration
D by transpiration

4 An experiment was carried out to determine the effect of sucrose concentration on the mass of potato. Identical pieces of potato were placed in sucrose solutions of different concentrations. After three hours, the mass of each potato piece was measured.
Which graph shows the results of this experiment?



5 Which row is correct?

	substance	elements contained in substance			
		carbon	hydrogen	nitrogen	oxygen
A	carbohydrates	√	√	√	*X*
B	fats	√	*X*	√	√
C	proteins	√	√	√	√
D	water	√	√	*X*	*X*

6 The diagram represents an enzyme and its active site.

Some statements about the active site are listed.

1 It accounts for the specificity of the enzyme.
2 It can be used once only.
3 It is altered irreversibly by exposure to a high temperature.

Which statements are correct?

A 1 and 2 only
B 1 and 3 only
C 1, 2 and 3
D 2 and 3 only

7 What is a function of the hydrochloric acid produced in the stomach?

A to help absorption of all food in the stomach
B to kill bacteria in the ingested food
C to prevent chemical digestion
D to prevent the stomach contents being too acidic

8 Which enzymes are secreted from the pancreas?

1 amylase
2 lipase
3 protease

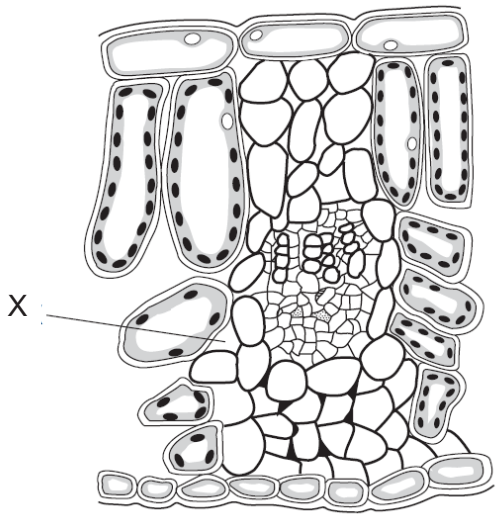
A 1 and 2 only
B 1 and 3 only
C 1, 2 and 3
D 2 and 3 only

9 When plants carry out photosynthesis, a carbohydrate is produced.
How is the carbohydrate used in plants?

	converted to protein	stored as starch	used for making cellulose	used to release energy
A	√	√	√	√
B	√	x	√	x
C	x	√	x	√
D	x	√	√	x

Key √ = yes x = no

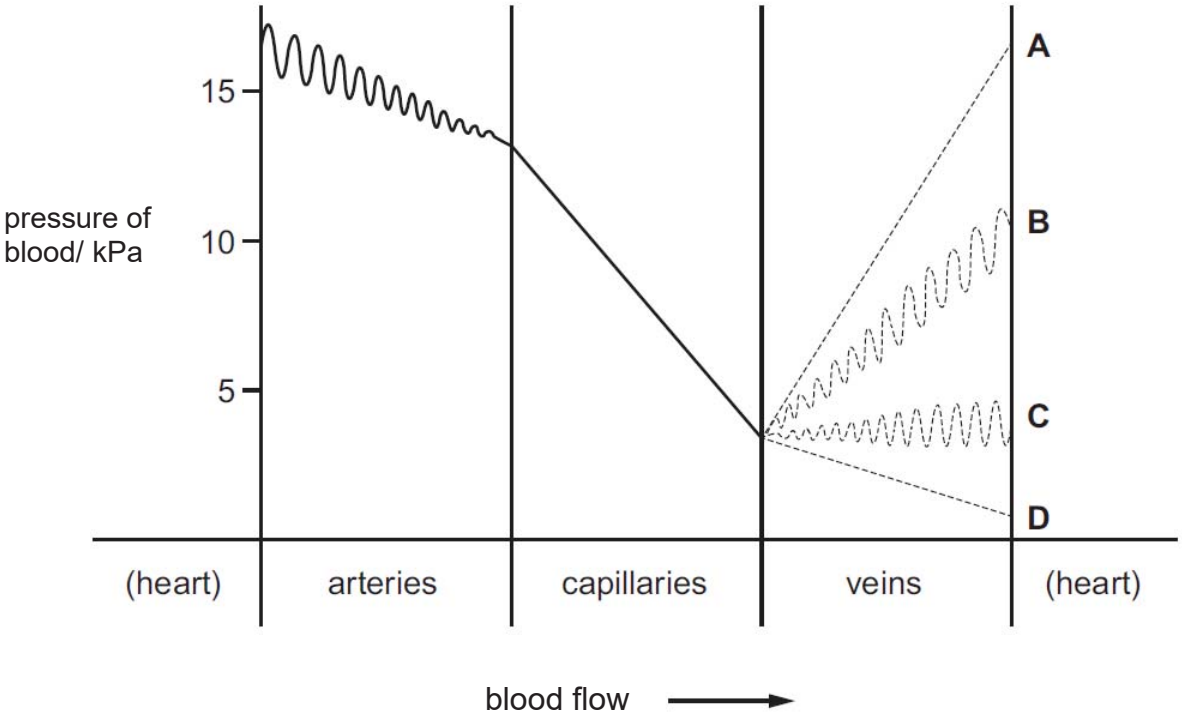
10 The diagram represents a cross-section of part of a leaf.



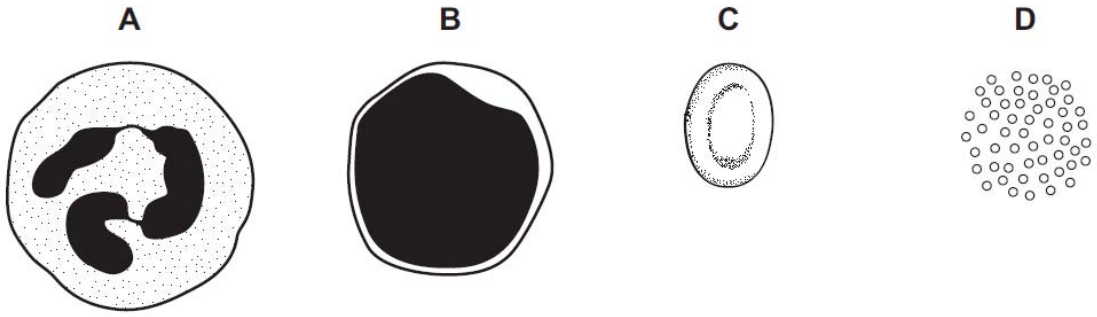
How does the oxygen content of the air at X compare to normal atmospheric air when the leaf is in the light and when it is in the dark?

	in the light	in the dark
A	higher	lower
B	higher	the same
C	lower	higher
D	lower	the same

11 The diagram shows the blood pressure of a person at rest as the blood leaves the heart and passes through arteries and then capillaries.
Which line shows the pressure of blood as it flows through the veins before returning to the heart?



12 The diagram show some components of blood of a mammal.
Which component causes the blood to start clotting?

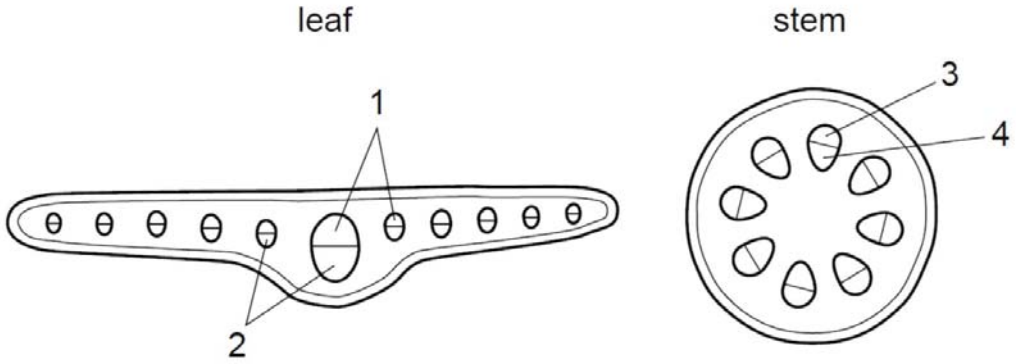


13 The table shows two plant tissues with their possible functions.

	tissue	functions	
		support	transport
1	phloem	√	√
2	phloem	*X*	√
3	xylem	√	√
4	xylem	√	*X*

Which rows show the correct functions for phloem and xylem?
A 1 and 3
B 1 and 4
C 2 and 3
D 2 and 4

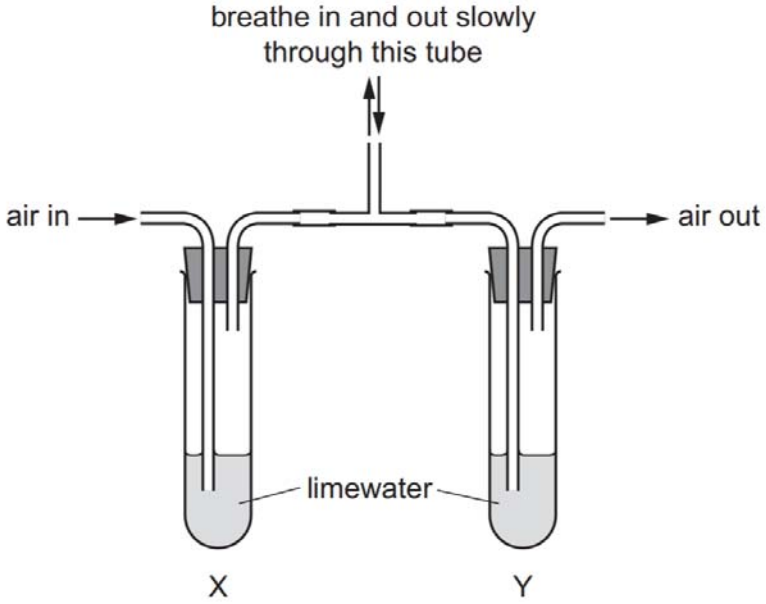
14 In an experiment to investigate the transport of water, the roots of a plant are placed in water coloured with a dye. The diagrams show sections of the leaf and stem.



Which numbered parts will become stained by the dye as the water is initially absorbed?

	leaf	stem
A	1	3
B	1	4
C	2	3
D	2	4

15 A student uses the apparatus shown to investigate the composition of inspired and expired air.



What is the appearance of the limewater after one minute of breathing in and out?

	tube X	tube Y
A	clear	clear
B	clear	white precipitate
C	white precipitate	clear
D	white precipitate	white precipitate

16 What is produced during anaerobic respiration in muscles?

A alcohol, carbon dioxide and water
B carbon dioxide and lactic acid
C carbon dioxide only
D lactic acid only

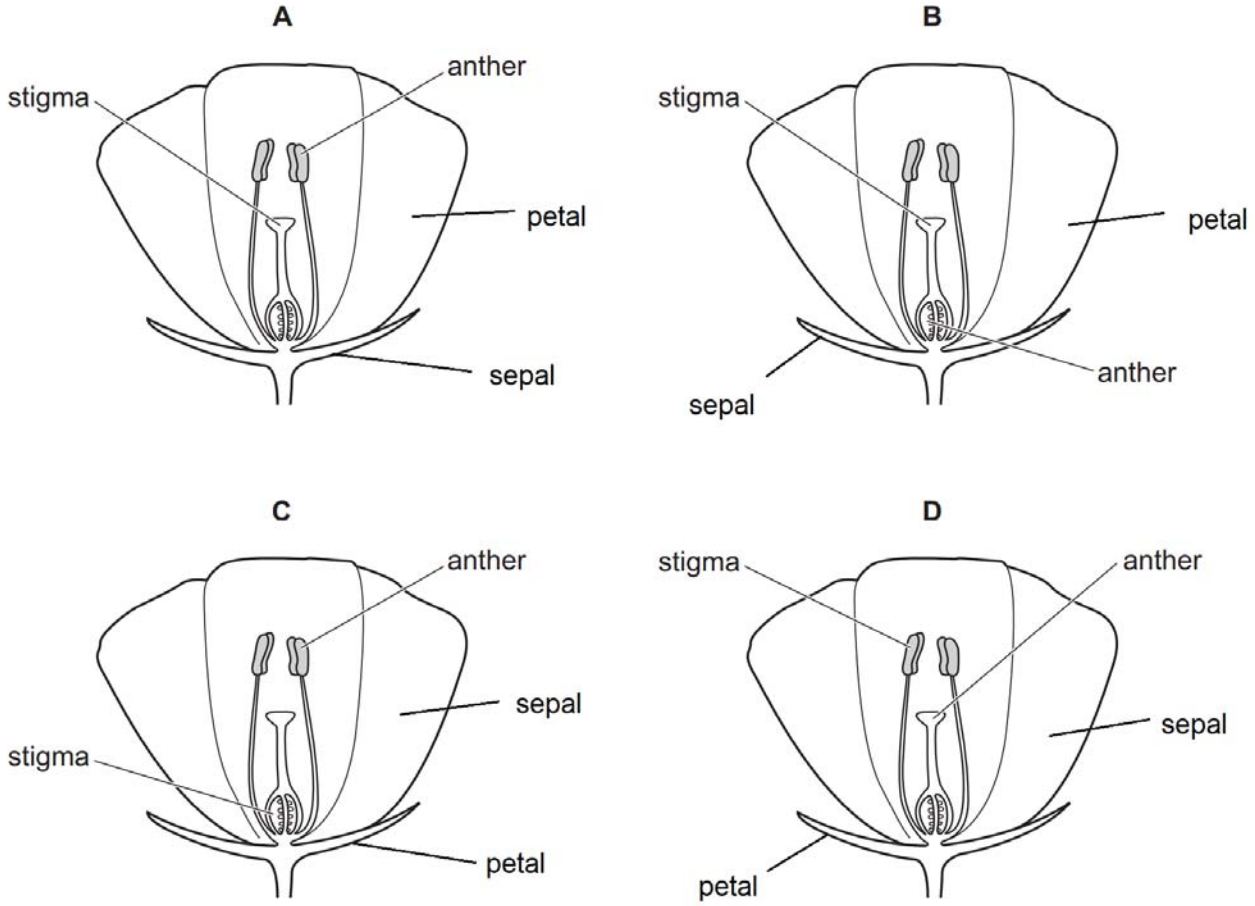
17 Which component of tobacco smoke reduces the ability of haemoglobin to carry oxygen?

A carbon monoxide
B nicotine
C smoke particles
D tar

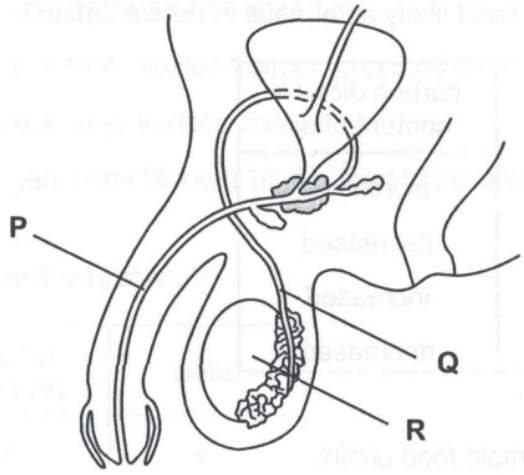
18 Which row describes asexual reproduction?

	number of parents	a zygote is produced	offspring identical to the parent
A	1	no	yes
B	1	yes	no
C	2	no	yes
D	2	yes	no

19 Which diagram of a flower is correctly labelled?



20 The diagram below shows the male reproductive system.



What are the identities of structures **P**, **Q** and **R**?

	P	Q	R
A	sperm duct	urethra	testis
B	testis	sperm duct	urethra
C	urethra	sperm duct	testis
D	urethra	testis	sperm duct

End of Paper

Name:	Class	Register Number

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PRELIMINARY EXAMINATION 2021
Science (Biology) 5107
Secondary 4 Normal Academic
Paper 6

13 August 2021 (Friday) **0815 – 0930** **Paper 5 & 6: 1 h 15 min**

READ THESE INSTRUCTIONS FIRST

Write your name, class and register number on all the work you hand in.
Write in dark blue or black pen in the spaces provided on the Question Paper.
You may use a soft pencil for any diagrams or graphs.
Do not use staples, paper clips, highlighters, glue or correction fluid.

Answer **all** questions in Section A and any **two** questions in Section B.
In calculations, you should show all the steps in your working, giving your answer at each stage.
At the end of the examination, hand in your answers for Paper 5 and Paper 6 separately.
The number of marks is given in brackets [ ] at the end of each question or part question.
You are advised to spend no longer than 30 minutes on Paper 5.
You may proceed to answer Paper 6 as soon as you have completed Paper 5.

Paper 5	**Paper 6 Section A**				**Paper 6 Sub-total Section A**	/14
	1	2	3	4		
					Paper 6 Sub-total Section B	/16
	Paper 6 Section B					
/20	5	6	7		**Overall marks**	**/ 50**

Setter: Mr Ng Hock Ping

Section A: Structured Questions (14 marks)

For Examiner's Use

Answer **all** the questions in the spaces provided.

1 Water is transported through plants.

(**a**) Fig. 1.1 shows the pathway taken by water through the cells of a root.

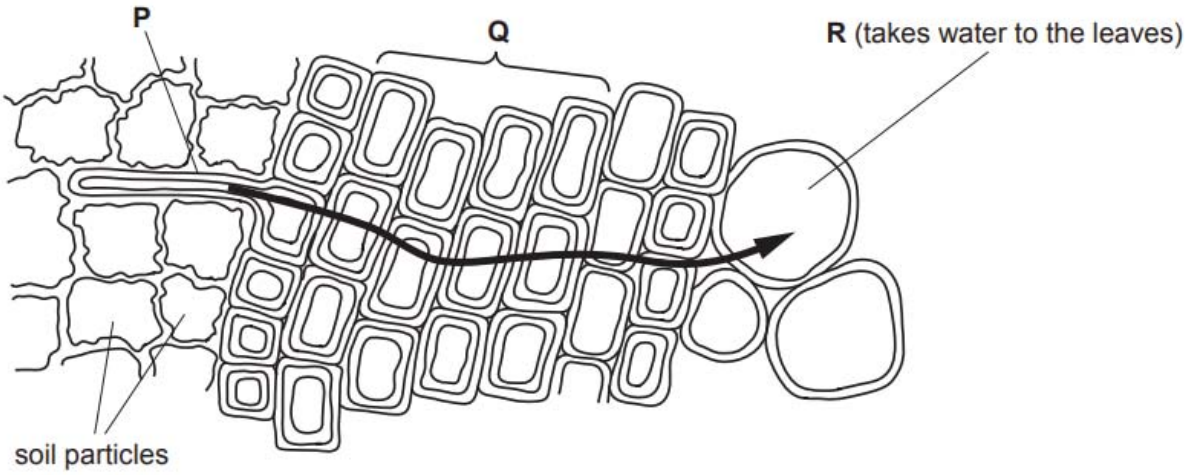

Fig. 1.1

Identify cells **P** and **R** shown in Fig. 1.1.

P .....

R .....
[2]

(b) Describe the process that enables water molecules to move from **P** through **Q** into **R**.

……

……

……[1]

(c) Transport of water in plants involves transpiration.

(i) Explain how transpiration enables water molecules to move from **R** into the leaves.

……

……

……[1]

(ii) State one factor that affects the rate of transpiration.

.....[1]
[Total: 5]

2 **(a)** Complete Table 2.1 to show the function of different components of blood.

For Examiner's Use

Table 2.1

components of blood	function
red blood cells	
	produces antibodies
	transport hormones
platelets	

[2]

(b) Blood transports carbon dioxide around the body.

(i) Name the process in the body that produces carbon dioxide.

..... [1]

(ii) Carbon dioxide moves from the cells into the blood. Complete the sentences to describe how carbon dioxide moves out of a cell into the blood.

The concentration of carbon dioxide is ..... inside the cell than in the blood. This causes carbon dioxide to move out of the cell by ..... [2]

[Total: 5]

3 Fig. 3.1 shows a graph of activity against temperature for two enzymes, **A** and **B**.

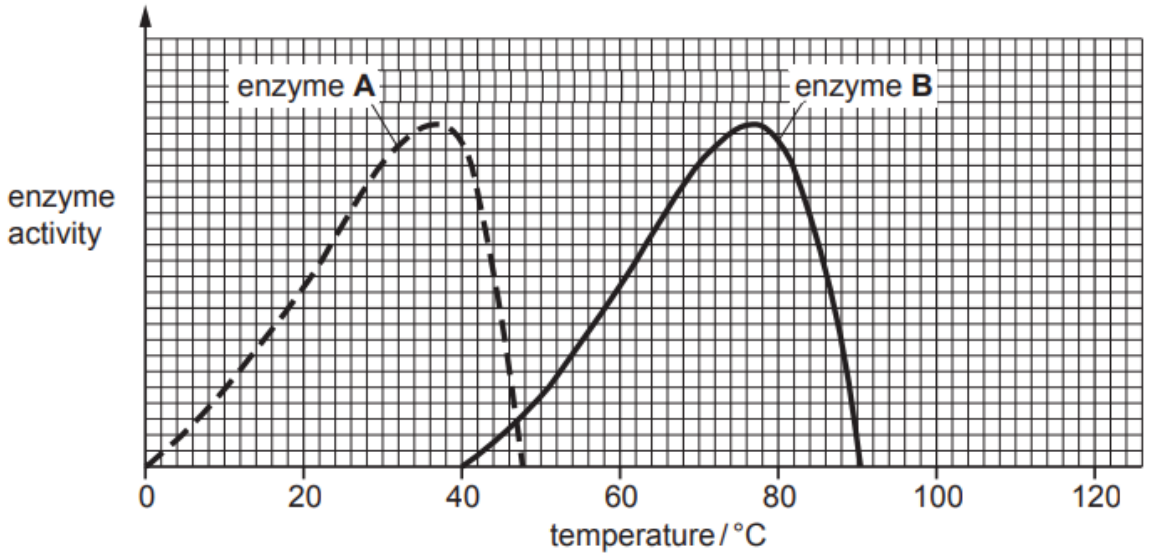

Fig. 3.1

(a) Identify the temperature of maximum activity of enzyme **B**.

temperature = ...°C [1]

(b) Amylase is a digestive enzyme secreted in parts of the alimentary canal. Suggest which enzyme, **A** or **B**, is amylase. Give a reason for your answer.

enzyme .....

reason .....

..... [1]

[Total: 2]

4 The boxes on the left show some parts of the reproductive system in plants. The boxes on the right show the function of each part.

For Examiner's Use

Draw one straight line from each part to match its function.

part	function
ovule	produce the pollen
anther	fertilisation takes place here
ovary	pollination takes place here
stigma	become the fruit after fertilisation

[2]

Section B: Free Response Questions (16 marks)
Answer any **TWO** questions and write your answers in the spaces provided.

For Examiner's Use

5 Fahmy conducted an experiment to measure the volume of gas produced by a sample of water weed (*Elodea*) at different light intensities by counting the number of bubbles of gas released every 30 seconds.

The experimental set up is shown in Fig. 5.1.

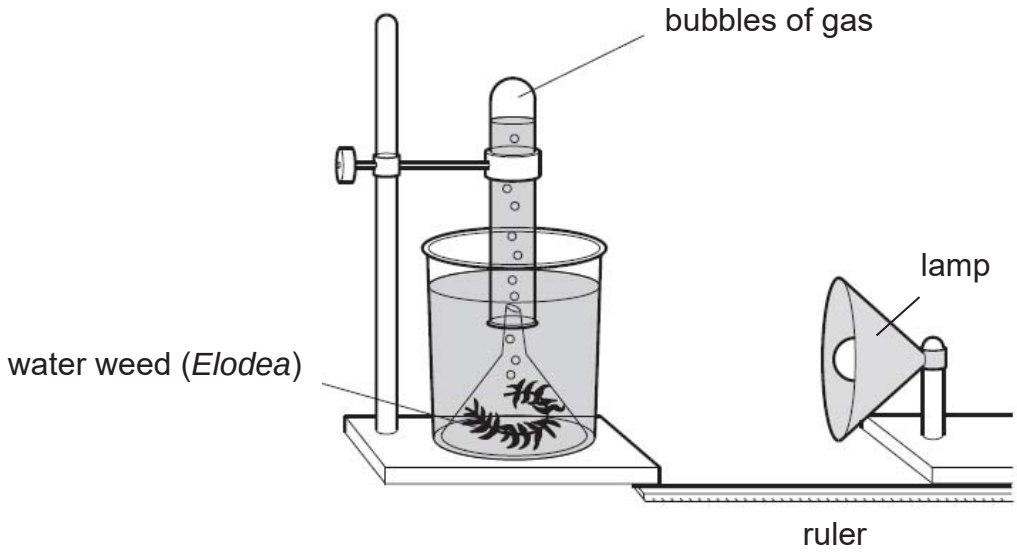

Fig.5.1

The results of this investigation are shown in the table below.

Table 5.2

distance of light / cm	number of bubbles observed
10	45
20	40
30	35
40	28
50	20
60	12
70	10

(a) Name the process occurring in the *Elodea* plant that released this gas.

……[1]

(b) Write the word equation for this process.

……

…… [1]

(c) Using data from Table 5.2, plot a graph of these results on Fig. 5.3.

For Examiner's Use

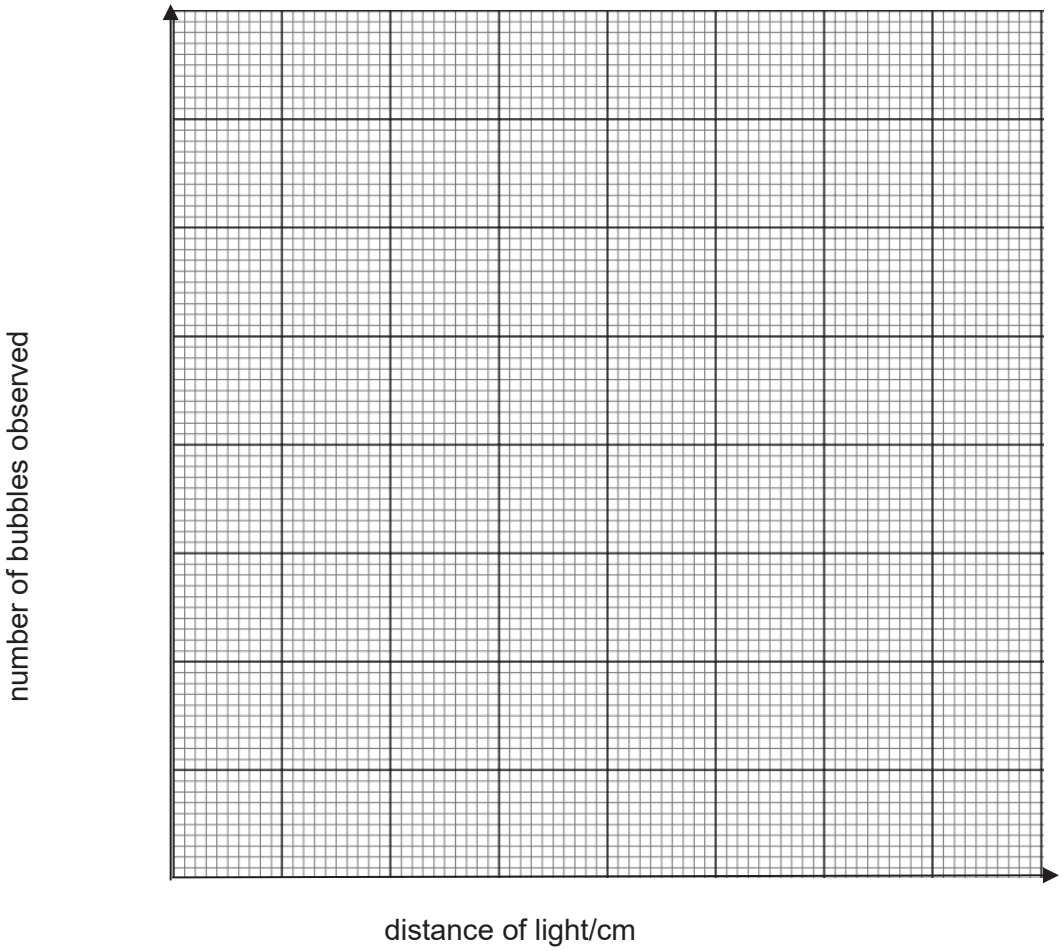

Fig. 5.3

[3]

(d) What does the graph tell you about the effect of light intensity on the process in **(b)**? Explain your answer.

……

……

……

…… [2]

(e) Suggest why a small amount of sodium hydrogen carbonate is added to the water to release carbon dioxide at the beginning of the experiment.

……

……

…… [1]

[Total:8]

6 Fig. 6.1 shows a diagram of the internal structure of the heart and the blood vessels to and from the heart.

For Examiner's Use

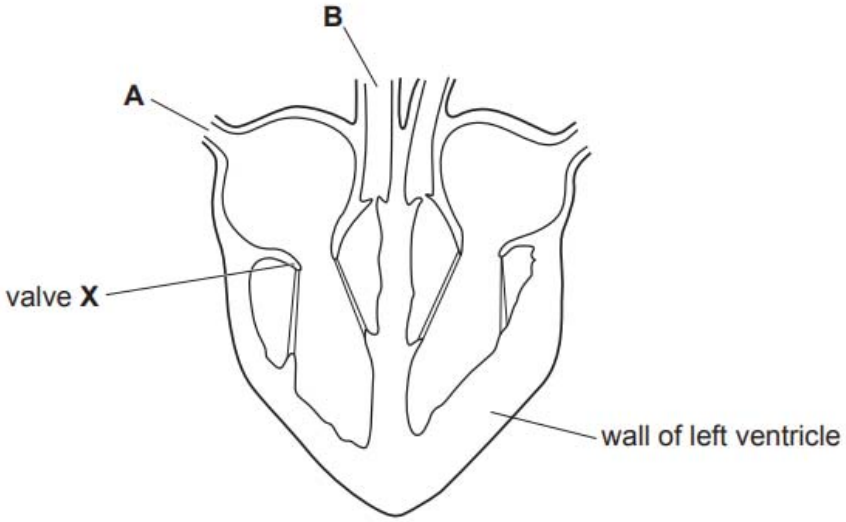

Fig. 6.1

(a) Name the blood vessels **A** and **B**.

A .....

B ..... [2]

(b) Describe the action of the atrium, ventricle and valve **X** to cause blood to flow from vessel **A** to vessel **B**.

.....

.....

.....

.....

.....

..... [3]

(c) The coronary arteries provide blood to the heart muscle.

(i) Suggest how a blockage of the coronary arteries affects heart function.

.....

.....

..... [2]

(ii) State one factor which increases a person's chance of developing coronary heart disease.

..... [1]

[Total:8]

7 Fig. 7.1 shows the process of human fertilisation and early development of an embryo.

For Examiner's Use

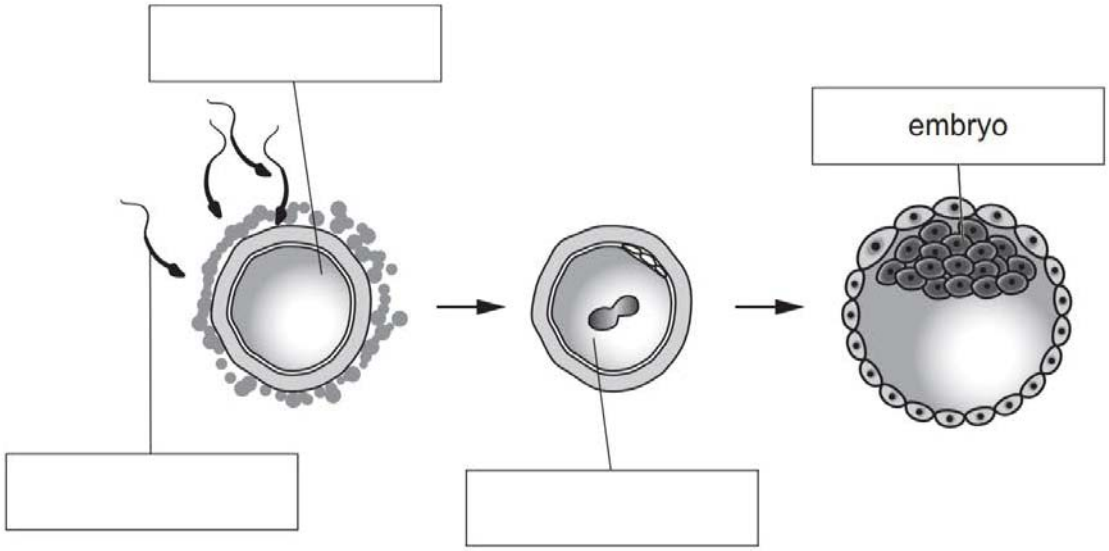

Fig. 7.1

(a) Complete Fig. 7.1 using words from the following list.

fetus	nucleus	ovum
sperm	uterus	zygote

[2]

(b) Fig. 7.2 is a diagram of the female reproductive system in humans.

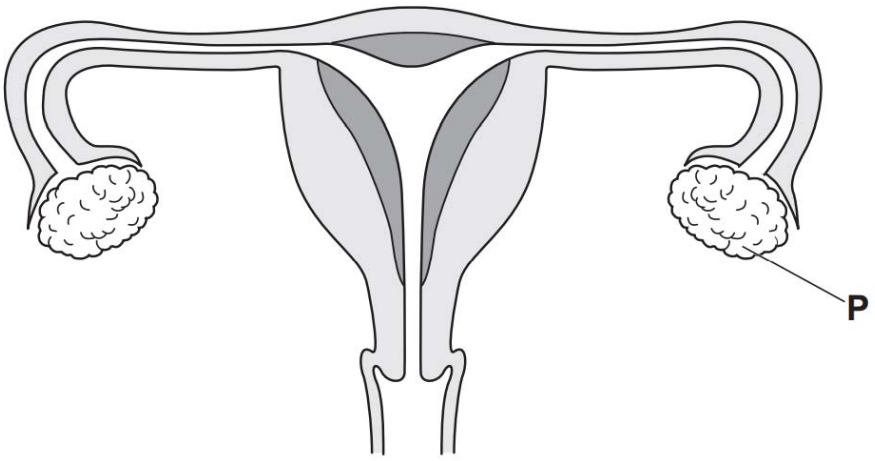

Fig.7.2

On Fig. 7.2,

(i) **use a label line** and the letter **Q** to show where fertilisation occurs. [1]

(ii) **use a label line** and the letter **R** to show where embryo is implanted. [1]

(c) Describe the changes that occur in structure **P** during the menstrual cycle.

For Examiner's Use

.....

.....

.....

.....

..... [2]

(d) Acquired Immunodeficiency Syndrome (AIDS) is a sexually transmitted disease caused by human immunodeficiency virus (HIV) infection.

State two ways of preventing the transmission of HIV.

1 .....

2 .....[2]

[Total: 8]

End of Paper

For Answer please email :

LAPOOPOO555@GMAIL.COM

to share with you.