NAME:	CLASS:	INDEX NO:

45

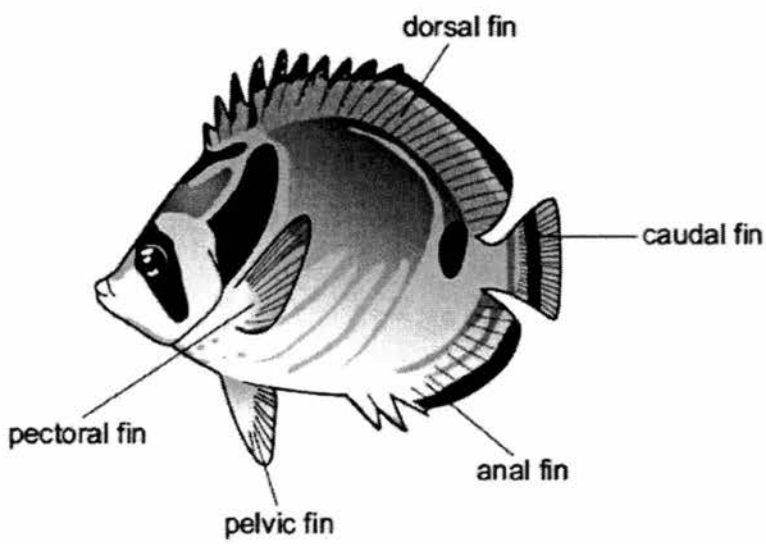
SECTION 2: BIOLOGY SECTION

SECTION 2 (A): Multiple Choice Questions (15 marks)
Answer **all** the questions in this section in the table on **page 17**.

1 What could be a consequence of deforestation?

A More habitats are produced for animals and plants.
B More transpiration may increase rainfall.
C Rainwater runs off the land causing flooding.
D Soil erosion is less likely.

2 The diagram shows a fish.



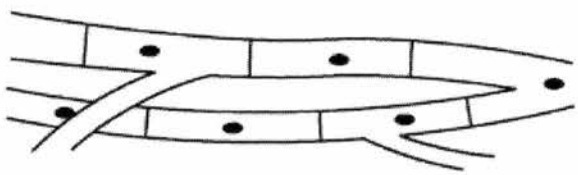
Use the key to identify the fish.

1	black stripe across the eye	..... go to 2
	no black stripe across the eye	..... **A**
2	black stripe on caudal fin	..... go to 3
	no black stripe on caudal fin	..... **B**
3	black spot below dorsal fin	..... **C**
	no black spot below dorsal fin	..... **D**

3 Which parts are found in both plant and animal cells?

A cell membrane, large vacuole
B cell membrane, cytoplasm
C cell wall, large vacuole
D cell wall, cytoplasm

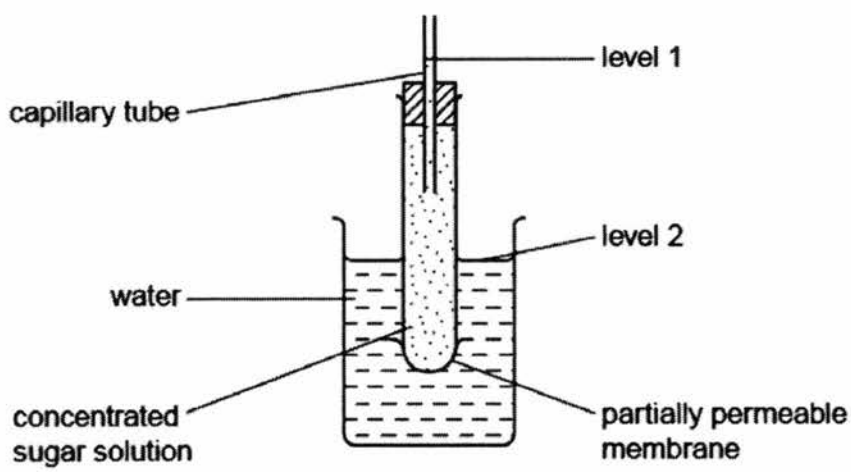
4 The diagram shows some heart muscle cells.



Which describes the level of organisation of these cells and their specific function?

	Level of organisation	Specific function
A	organ	contraction
B	organ	support
C	tissue	support
D	tissue	contraction

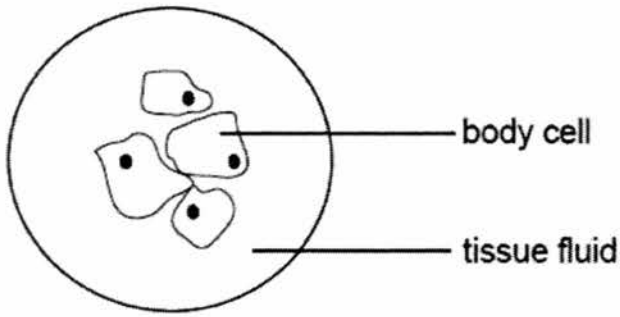
5 The diagram shows an apparatus used to investigate osmosis.



Which molecules will move across the membrane and which changes in levels will occur?

	molecules	level 1	level 2
A	sugar	fall	rise
B	water	fall	rise
C	sugar	rise	fall
D	water	rise	fall

6 The diagram shows a group of body cells surrounded by tissue fluid.

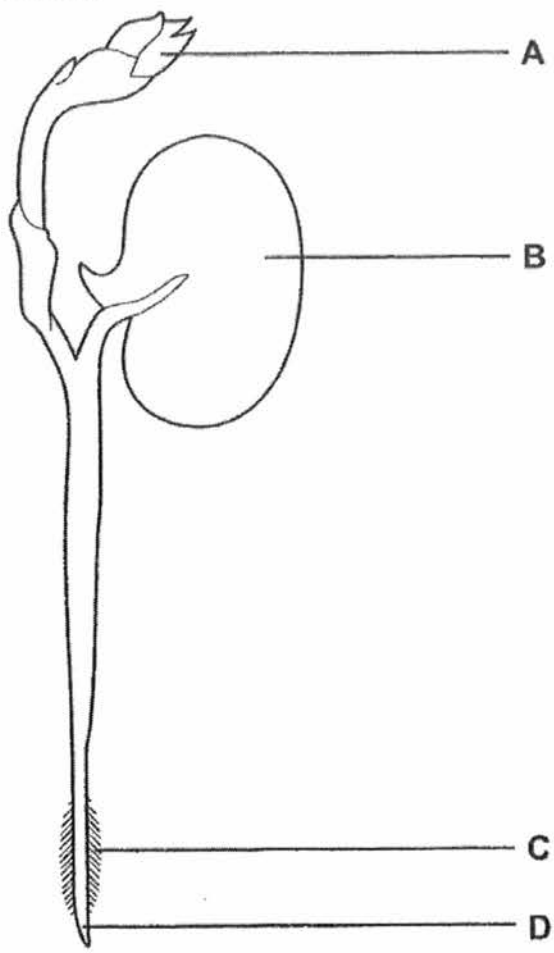


Which conditions cause the body cells to take in water?

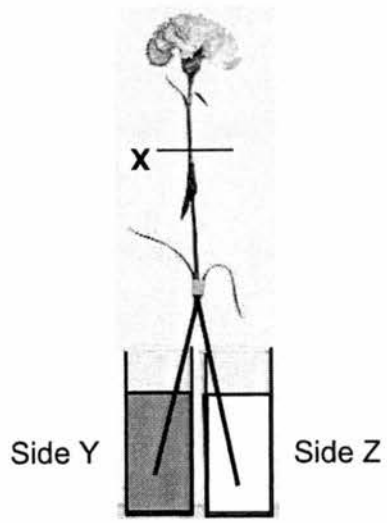
	Water potential in the tissue fluid	Water potential in the cytoplasm of the body cells
A	high	high
B	high	low
C	low	high
D	low	low

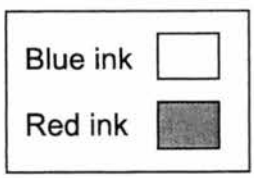
7 The diagram shows a bean seedling, soon after it has germinated.

Where is most water absorbed?



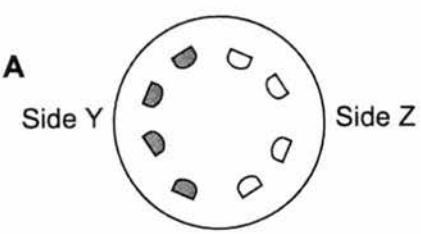
8 The diagram shows a carnation flower stalk cut vertically into two halves at its base. Each half was then soaked in a different coloured liquid as stated in the box. The stalk was then placed in an airy and bright area for three days. At the end of the third day, the stalk was cut along line **X** and examined under a magnifying glass.



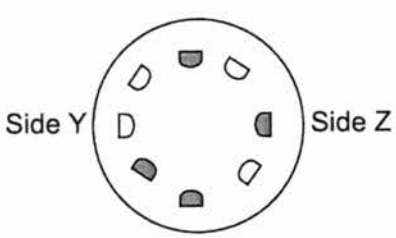


The following diagrams represent the cut stem and the stained areas in the stem. What is the expected appearance of the cut stem on the third day?

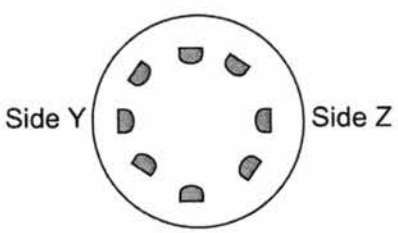
A



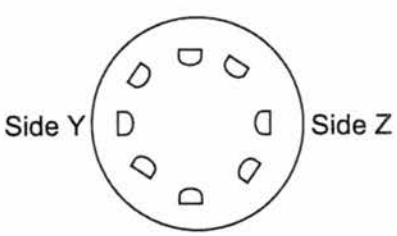
B

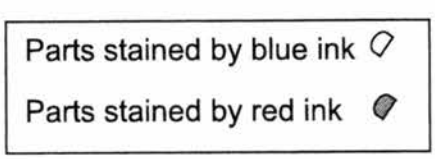


C

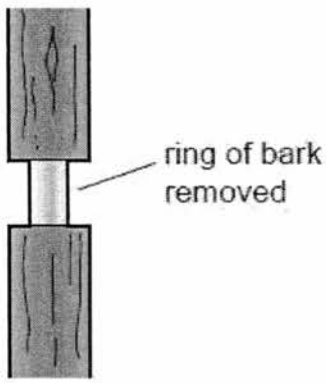


D





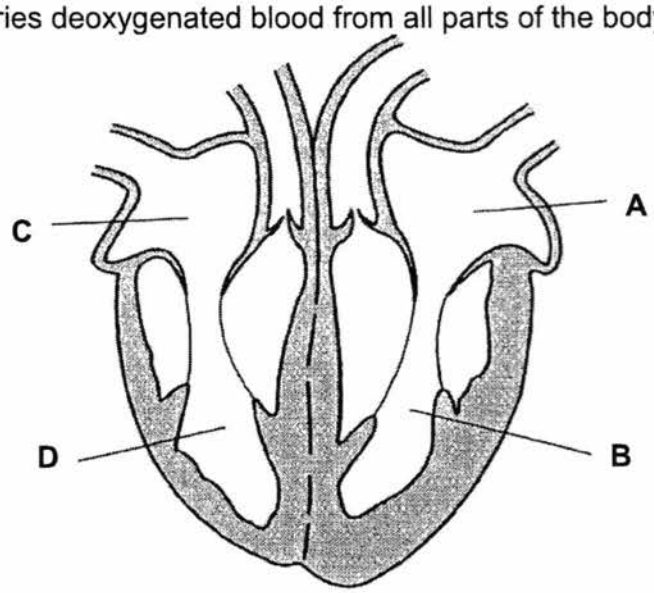
9 The diagram shows a tree trunk, with a ring of bark, which includes the phloem, removed.



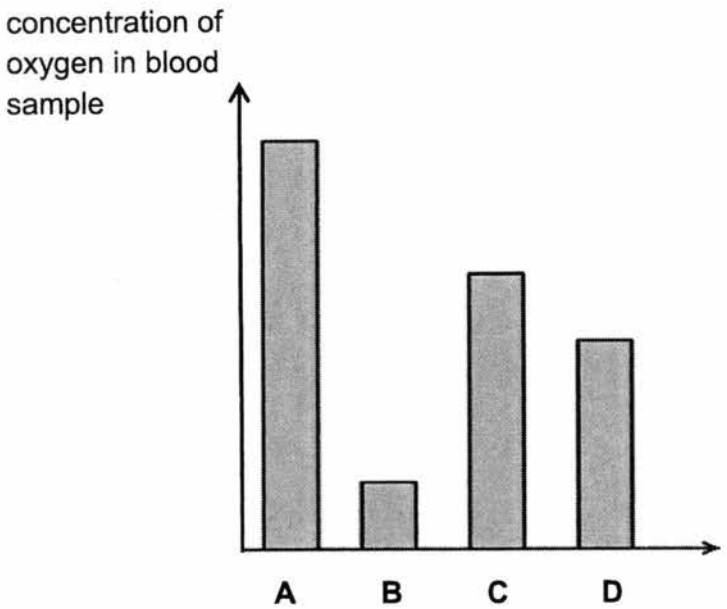
The tree will eventually die because this action cuts off the supply of

A mineral salts to the leaves.
B manufactured food to the roots.
C oxygen to the roots.
D water to the leaves.

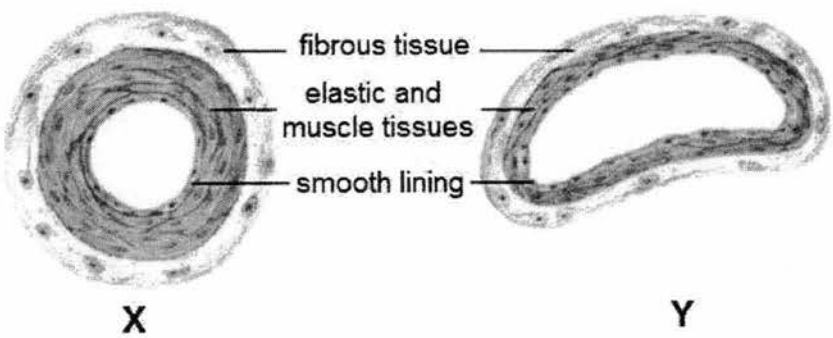
10 The diagram below shows the structure of the heart.
Which structure carries deoxygenated blood from all parts of the body?



11 The bar chart shows the concentration of oxygen in blood samples taken from four different blood vessels in the human circulatory system. Which blood sample is taken from the artery entering the lungs?



12 The diagrams below show the cross-section of two types of blood vessels.



What do **X** and **Y** represent?

	X	Y
A	Artery	Capillary
B	Artery	Vein
C	Capillary	Vein
D	Vein	Artery

13 Which of the following is the correct function of the oesophagus?

A It releases bile.
B It breaks up the food.
C It rolls the food into small balls.
D It pushes the food from the mouth to the stomach.

14 Runners sometimes eat bananas before long-distance running races because they contain

A a large amount of water to keep the runner hydrated.
B fats to release a lot of energy at a slow, steady rate.
C carbohydrates which can supply energy.
D proteins to repair muscle cells damaged while running.

15 A scientist extracted a protease from the stomach and subjected it to different pH conditions (acidic or alkaline). In which set-up will digestion take place?

	Acidic condition	Alkaline condition	Food molecule
A	Absent	Present	Carbohydrate
B	Present	Absent	Carbohydrate
C	Present	Absent	Protein
D	Present	Present	Protein

Qns	1	2	3	4	5
Ans					
Qns	6	7	8	9	10
Ans					
Qns	11	12	13	14	15
Ans					

END OF SECTION 2 (A)

SECTION 2 (B): Structured Questions (20 marks)
Answer **all** the questions in this section in the spaces provided.

B1 Fig B1.1 shows six arthropods.

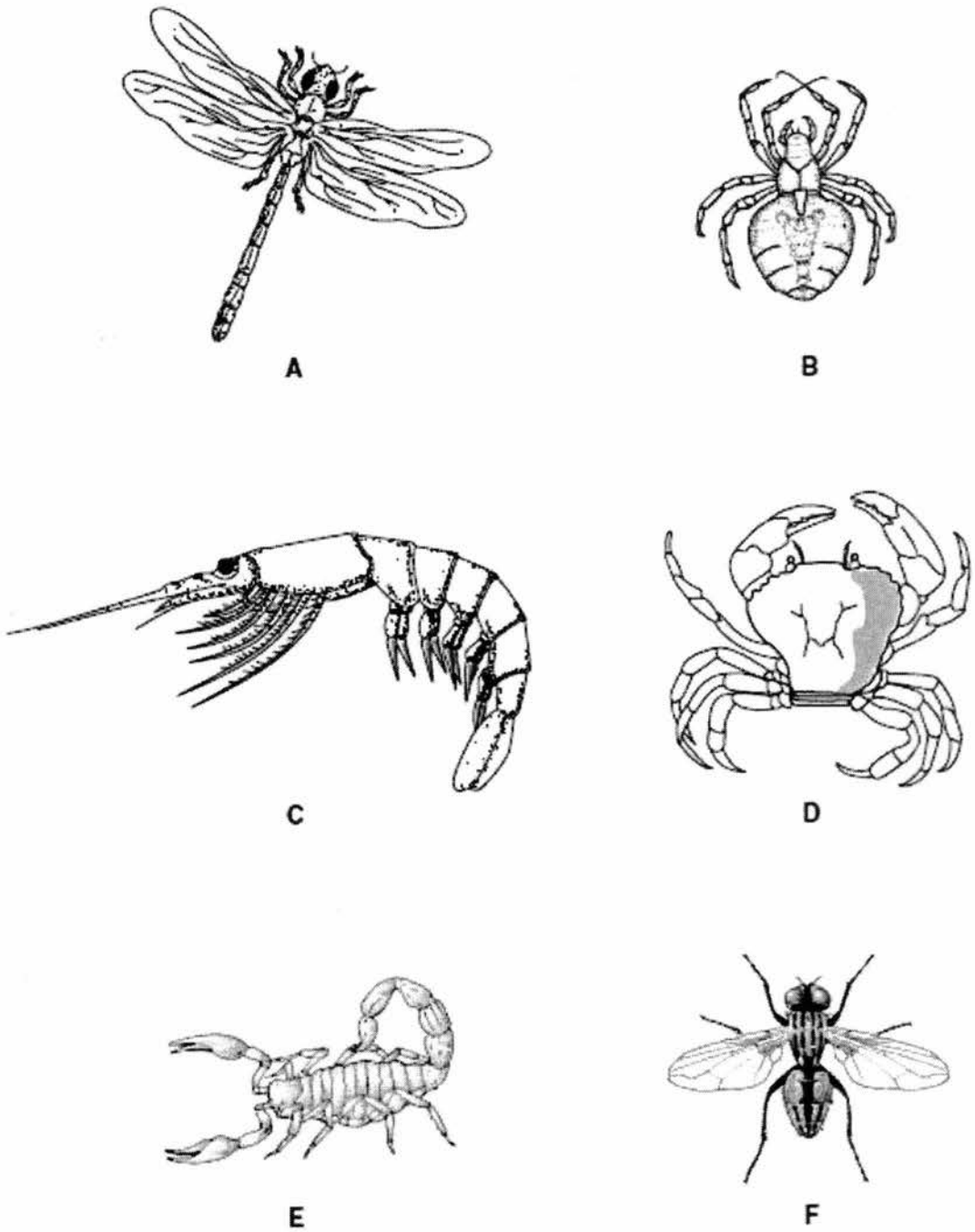
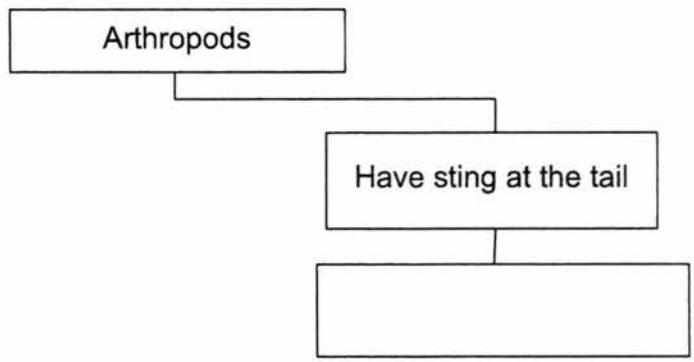


Fig. B1.1

Construct a dichotomous key to enable the identification of these six animals. [4]



B2 A student cuts 9 equal-sized pieces of potato and places them in liquids as shown in Fig. B2.1.

A
dilute sugar solution

B
pure water

C
highly concentrated sugar solution

Fig. B2.1

After 30 minutes, the student finds that changes have taken place to the pieces of potato in containers **B** and **C**. The changes are a result of osmosis.

(a) Fig B2.1A shows a cell from strip **B** that the student draws after observation under a light microscope before the experiment. On Fig B2.1B, draw the sap vacuole, using a pencil, to show how it would look like after the experiment. [1]

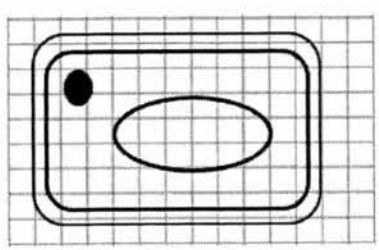


Fig B2.1A
Before experiment

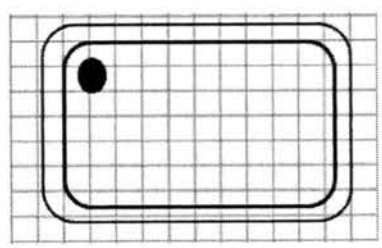


Fig B2.1B
After experiment

(b) Describe the changes to the length and texture of the potato pieces in containers **B** and **C**.

B: .....[1]

C: .....[1]

(c) Explain why there is no change to the length of potato pieces in container **A** after 30 minutes.

.....

.....

.....[2]

B3 Fig. B3.1 shows a part of a root hair cell.

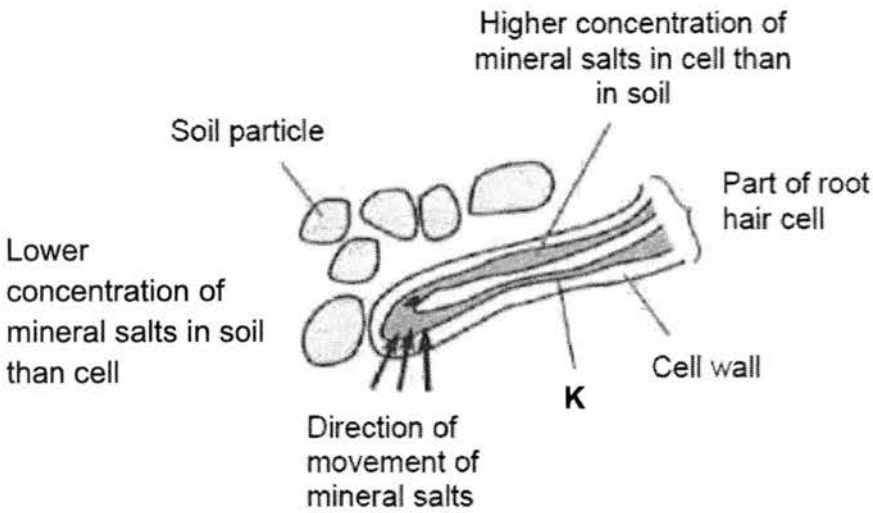


Fig. B3.1

(a) It is found that the soil is low in mineral salts, in comparison to their respective concentrations found in the root hair cell.

Name the process that transports the mineral salts into the root hair cell.

.....[1]

(b) **(i)** Suggest the direction of the net movement of water.

.....[1]

(ii) Explain why water moves in the direction stated in **(b)(i)**.

.....

.....[1]

(c) The plant cell contains high concentration of other substances such as starch but they are unable to move out from the cell into the soil. This is because their movement is restricted by structure **K**.

(i) State the property of **K** that restricts the movement of starch.

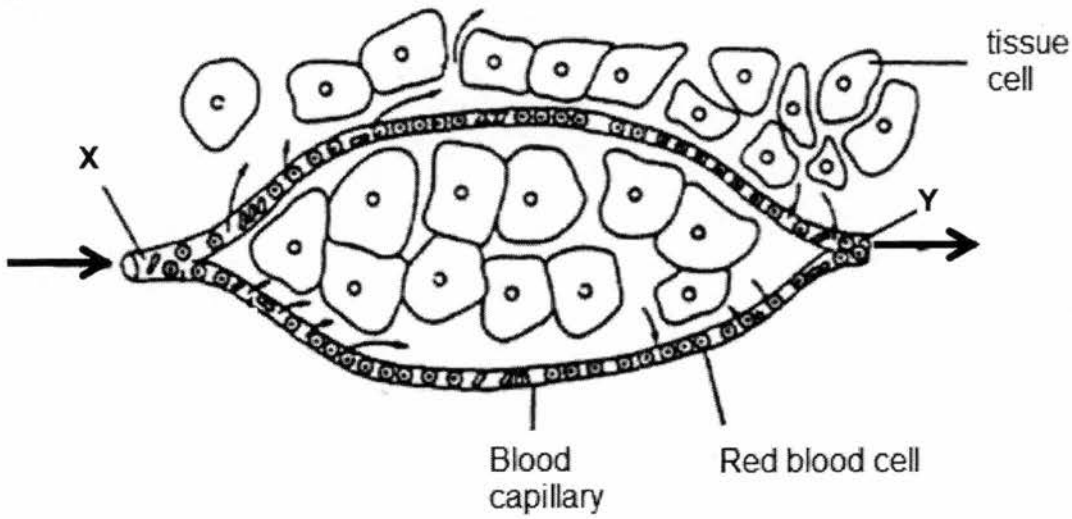
.....[1]

(ii) Explain why starch cannot pass through **K**.

.....

.....[1]

B4 Fig. B4.1 shows the blood flowing through a blood capillary found among the cells of a body tissue



→ **Direction of blood flow**

Fig. B4.1

(a) Name each of the following blood vessels:

(i) Vessel carrying blood to **X** .....[1]

(ii) Vessel carrying blood away from **Y** .....[1]

(b) What is the main function of the red blood cells?

.....[1]

(c) Explain why the number of white blood cells increases in the blood of a person who suffers from an infection.

.....

.....[1]

(d) Another component of the blood also increases in number when a person suffers a cut on the blood vessel and is bleeding.

(i) Name this component

.....[1]

(ii) Explain why this component increases in number.

.....

.....[1]

END OF SECTION 2 (B)

SECTION 2 (C): Structured Questions (10 marks)

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

C5 **(a)** Fig. C5.1 shows a part of the alimentary canal.

Fig. C5.1

There are two processes that help to digest food in this organ.

Describe and explain how specific parts and substances in each of these processes help to digest the food.

(i) Physical digestion

.....

.....[2]

(ii) Chemical digestion

.....

.....[2]

(b) Fig. C5.2 shows a mixture of cooking oil and water as seen under a microscope.

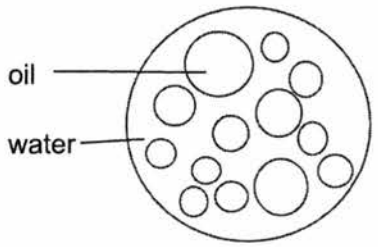
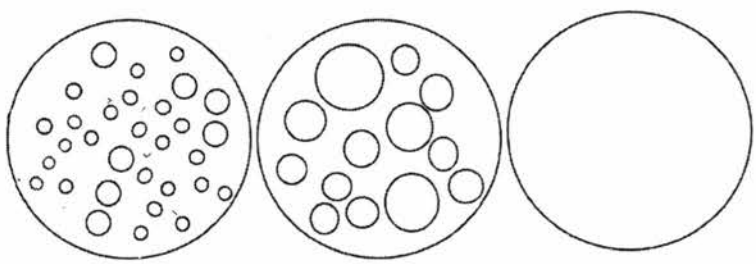


Fig. C5.2

Three different substances (lipase, protease and bile) were added separately to 3 samples of the mixture of oil and water. Each sample was left for twenty minutes. The results are shown in Fig. C5.3.



Sample **P** Sample **Q** Sample **R**

Fig. C5.3

(i) Write the correct sample (**P**, **Q** or **R**) in each box below.

Treatment	Sample
Lipase	
Protease	
Bile	

[2]

(ii) Name the process that has caused the change in the appearance of sample **P**.

.....[1]

(iii) Explain what happened to sample **R**.

.....

.....[1]

(iv) Which part of the alimentary canal would you expect to find sample **R**?

.....[1]

(v) What property of the enzyme protease can be deduced from this experiment?

.....[1]

END OF PAPER

QUEENSWAY SECONDARY SCHOOL
Science Department

MID YEAR EXAMINATION 2017

MARK SCHEME

Level: 1 Express

Subject: Lower Secondary Science (Biology)

Total Marks: 45

Setter: Ma CW & Celine Tan

Section A [15 marks]

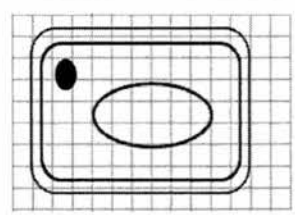
Qn	1	2	3	4	5	6	7	8	9	10
Ans	C	D	B	D	D	B	C	A	B	C
Qn	11	12	13	14	15					
Ans	B	B	D	C	C					

Section B [20 marks]

B1 deduct 1M if lines are not drawn by ruler 4
every right branch to get the correct group / id of the organism [1M]
deduct 1 M for every wrong answer/ branch

Total = 4

B2 **(a)** Bigger sap vacuole 1
No mark for drawing done with pen



(b) **B**: longer + rough ; 1
C: shorter + smooth ; 1

(c) the potato cells and dilute sugar solution has same water potential ; 2
no **net** movement of water into or out of the potato cells/no osmosis has occurred ;

Total = 5

B3 **(b)** Active Transport 1

(b) **(i)** From the soil into the root hair cell 1

(ii) There is a higher water potential in the soil than in the cell / water moves from its high water potential region to its low water potential region 1

(c) **(ii)** partially permeable 1

(ii) Starch is made of big particles/molecules that cannot pass through the partially permeable membrane / **K**. 1

Total = 5

B4 **(a)** **(i)** Artery 1

(ii) Vein 1

(b) To transport oxygen (optional - from the lung to all parts of the body). 1

(c) to kill bacteria/fight infection 1

(d) **(i)** Platelet 1

(ii) for blood clotting 1

Total = 6

Section C [10 marks]

C1 **(a)** **(i)** Physical digestion: Teeth grind/cut/chew food into smaller pieces ; 1
to increase surface area for digestion by enzymes ; 1

(ii) Chemical: starch is digested into maltose ; 1
by amylase ; 1

(b) **(i)**

Treatment	Field of view
Lipase	**R**
Protease	**Q**
Bile	**P**

2

(1 mark for one correct and 2 marks for all correct)

(ii) Emulsification 1

(iii) Fat/oil is digested by lipase into fatty acids and glycerol (A: simpler soluble molecules) 1

(iv) Small intestine /ileum / duodenum 1

(v) Protease cannot digest oil/fats 1

Total = 10

NAME:	CLASS:	INDEX NO:

QUEENSWAY SECONDARY SCHOOL

MID YEAR EXAMINATION 2017

SECONDARY 1 EXPRESS

Parent's Signature:

LOWER SECONDARY SCIENCE

11 May 2017
1 hour 30 minutes

No additional materials are required.

READ THESE INSTRUCTIONS FIRST

Write your name and index number on all the work you hand in.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, glue or correction fluid.

There are **two** sections. Answer **all** questions.

Section 1: Physics (35 marks)
Answer **all** questions in the spaces provided.

Section 2: Biology (45 marks)
Answer **all** questions in the spaces provided.

The number of marks is given in brackets [ ] at the end of each question or part question.
At the end of the examination, hand in your answers to Section 1 and Section 2 separately.

The use of an approved scientific calculator is expected, where appropriate.

Setters: Mrs Sassi, Mr Enrico Tan (Phy)
Ms Celine Tan, Mr Ma Chung Wai (Bio)

[Turn over

SECTION 1: PHYSICS SECTION

35

SECTION 1 (A): Multiple Choice Questions (10 marks)
Answer **all** the questions in this section in the table on **page 5**.

1 Tammy wants to be a good scientist.
Which of the following descriptions is appropriate for the values that a scientist should have?

	Value	Description
A	Perserverance	To keep trying until she gets her hypothesis correct
B	Open-mindedness	To be open to ideas and suggestions only from fellow scientists
C	Objectivity	To follow the facts even when what others initially believed was different
D	Integrity	To only report observations that suit the majority belief

2 Jill was late for the lesson and missed the laboratory safety briefing. Her friends suggested a few rules from what they remember. Which of the following is **not** one of the laboratory safety rules?

A There should not be any food brought into the laboratory.

B Safety goggles must be worn at all times no matter the experiment.

C We should not taste chemicals unless we recognize the chemical name written on the bottle.

D The laboratory door should not be locked except when the teacher is inside with the class.

3 Sammy uses a vernier caliper to measure the thickness of 10 pages of a notebook. **Fig. 3.1** shows the vernier caliper reading when it is tightly clamped on the 10 pages.

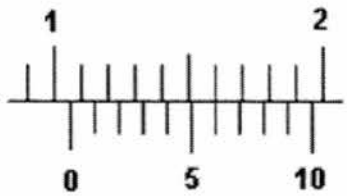


Fig. 3.1

What is the thickness of a single page?

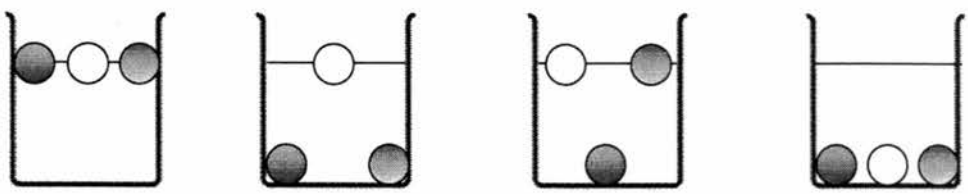
A 1.06 mm

B 1.60 mm

C 1.06 cm

D 1.60 cm

4 Three balls with different densities are placed into four beakers containing different liquids.



Which of the beakers contains the **second densest** liquid?

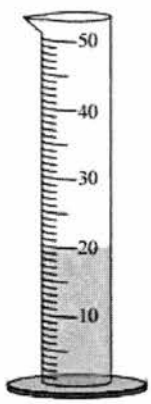
A W

B X

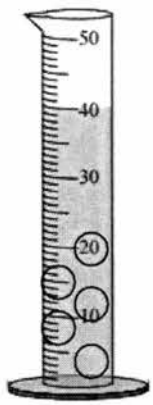
C Y

D Z

5 Fred wants to measure the volume of a marble. He places five similar marbles in a measuring cylinder that is partially filled with water.



Without marbles



With marbles

What is the volume of one marble?

A 4 cm^3

B 8 cm^3

C 20 cm^3

D 40 cm^3

6 Ted wants to heat up a test tube for an experiment. He is told to use a non-luminous flame.

Which of the following reasons is **false** in explaining why he should use a non-luminous flame for heating?

A It produces less or no soot at all.

B It is steadier than luminous flame.

C It is hotter and it burns more efficiently.

D It is blue in colour, while luminous flame is yellow.

7 Substance A is a solid at a room temperature of 25 °C.

What can you tell about its melting or boiling point?

A Substance A has a melting point of 25°C.

B Substance A has a boiling point of 100°C.

C Substance A has a melting point below 25 °C.

D Substance A has a boiling point above 25°C.

8 Joseph wants to make a water bottle suitable for everyone to use.
He is concerned about the material used to make the water bottle.
Which of the following physical properties is **not** an important factor that he should consider?

A The density of the material

B The ease at which the material will corrode

C The electrical conductivity of the material

D Whether the material has a higher melting point than water.

9 Which of the following is **not** an effect of forces?

A A wet towel being dried up under the sun.

B A soccer ball being kicked towards a goal.

C A basketball being deformed after being crushed.

D A volleyball changing direction after hitting the floor.

10 Which of the following statements is true about mass and weight?

A Weight is always the same regardless of location.

B Weight can be measured by a spring balance.

C Mass differs depending on gravity.

D Mass can be measured using a spring balance.

Qns	1	2	3	4	5
Ans					
Qns	6	7	8	9	10
Ans					

END OF SECTION 1 (A)

SECTION 1 (B): Structured Questions (17 marks)
Answer **all** the questions in this section in the spaces provided.

B1 State and explain one safety precaution when operating the Bunsen burner.

(a) Safety precaution:

.....[1]

Explanation:

.....[1]

(b) The following hazard symbols are found on a bottle of chemical **X**. State two safety precautions which you should take when handling chemical **X**.

Safety precaution 1:

.....[1]

Safety precaution 2:

.....[1]

B2 The hardness of four objects, P, Q, R and S is determined in an experiment. Each object is used to scratch the other three objects and the results are shown below.

Object used to scratch the other objects	Presence of scratches on object			
	P	**Q**	**R**	**S**
P		✓	✓	×
Q	×		×	×
R	×			×
S	✓	✓	✓	

Legend
✓ : scratches present
× : no scratches present

(a) Fill in the missing blank in the above diagram with a ✓ or a ×, for the test between Q and R. [1]

(b) Which object is the hardest? Explain your answer.

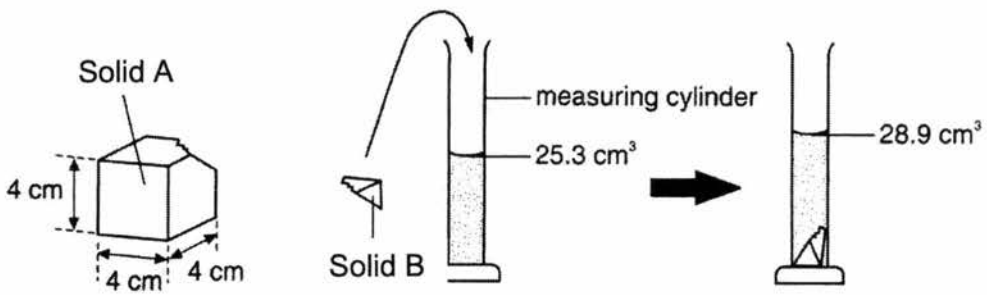
.....

.....[2]

(c) What is one possible use for the material of the object you have chosen in **(b)**?

.....[1]

B3 Solid **A** with a dimension of 4 cm by 4 cm by 4 cm has a corner chipped off. The chipped off corner, which is labelled as solid **B**, has a mass of 4.32 g.



Solid **B** is then submerged in a measuring cylinder containing water.

(a) Find the volume of solid **B**. [1]

(b) Calculate the density of solid **B**. [2]

(c) Calculate the mass of the remaining solid **A** after being chipped off. Round off your answer to 1 decimal place. [3]

B4 Lynn is pushing a trolley at a supermarket. When she stops pushing, the trolley stops moving.

(a) What force causes the trolley to slow down and stop?

.....[1]

(b) Give two other effects (other than the ones mentioned in this question) of forces.

.....

.....[2]

END OF SECTION 1 (B)

SECTION 1 (C): Structured Questions (8 marks)
Answer **all** the questions in this section in the spaces provided.

C5 Sharon bought two pots of money plants from a nursery. In one pot, she placed fertilisers while in the other she did not. She had read that fertilisers are additional nutrients for the growth of plants. She watered the plants daily. At the end of experiment, she wanted to find out if the fertilisers truly affected the growth of her money plants.

(a) What could be a hypothesis for the experiment?

.....

.....[1]

(b) Identify one variable that she needs to keep constant.

.....

.....[1]

(c) In order to measure the thickness of the stem, Sharon used a ruler.
What instrument would be more suitable than a ruler?

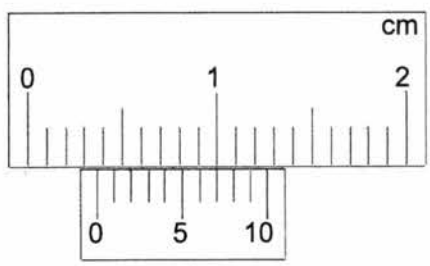
.....[1]

(d) Sharon plucked three leaves from each plant and measured the width of their stems. She recorded the readings in Table C5.1 below.

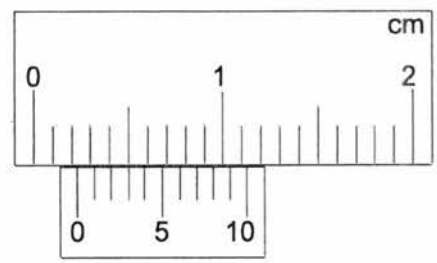
Table C5.1

	Width of leaf's stem / cm			
Plant Condition	**Leaf 1**	**Leaf 2**	**Leaf 3**	**Average**
With fertiliser	0.34	0.36		
Without fertiliser	0.29	0.25		

(i) The figures below represent the measurements for the third leaf of both plants. Read the scales below and record your answers in Table C5.1. [2]



Width of 3rd leaf of money plant **with** fertiliser



Width of 3rd leaf of money plant **without** fertiliser

(ii) Calculate the average width of the stems of the leaves of the two money plants in Table C5.1. Record your answers to 2 decimal places. [2]

(e) Based on her results, what conclusion can Sharon make?

.....

.....[1]

END OF SECTION 1

QUEENSWAY SECONDARY SCHOOL
Science Department

MID YEAR EXAMINATION 2017

MARK SCHEME

Level: 1 Express

Subject: Lower Secondary Science (Physics)

Total Marks: 35

Setter: Sri Idayu & Enrico Tan

PHYSICS SECTION:
SECTION 1(A): MCQ (10 marks)

1. C	2. A	3. A	4. C	5. C
6. D	7. D	8. C	9. A	10. B

SECTION 1(B): Structured Questions (17 marks)

1 **(a)** Safety precaution: When using the bunsen burner place it away from other objects. [1]

Explanation: If Bunsen burner is placed near other objects, they may catch fire.
Accept any possible answer. [1]

(b) Safety Precaution 1: Place the object far away from flame. [1]

Safety Precaution 2: Do not throw chemical in sink as it may corrode the sink. [1]

2 **(a)** ✓ [1]

(b) S is the hardest [1]. It scratches all other objects [1].

(c) Making cutting blades. [1]
(Accept any reasonable answer)

3 **(a)** $28.9 - 25.3 = 3.6\ cm^3$ [1]

(b) Density = 4.32/3.6 [1]
= 1.2 g/cm^3 [1]

(c) Volume of A = (4x4x4) – 3.6
= 60.4 cm^3 [1]

Mass = 60.4 x 1.2 [1]
= 72.5 g [1]

4 **(a)** Frictional force [1]

(b) A force can change the shape of an object [1]. A force can change the direction of a moving object [1].

Section 1(C): Free Response Questions (8 marks)

1 **(a)** If the amount of fertiliser given to plant increases then the height of plant increases. [1]

(b) Amount of water given to both plants [1].

(c) Vernier caliper. [1]

(d) **(i)** and **(ii)**

	Width of Stem of Leaves / cm			
Plant Condition	**Leaf 1**	**Leaf 2**	**Leaf 3**	**Average**
With fertiliser	0.34	0.36	(i)0.37 [1]	(ii)0.36[1]
Without fertiliser	0.29	0.25	(i)0.23 [1]	(ii)0.26[1]

(e) The money plant that has fertiliser has thicker stem for the leaves. [1]

THE END