



**MAURITIUS
EXAMINATIONS
SYNDICATE**

NATIONAL CERTIFICATE OF EDUCATION

SCIENCE

BIOLOGY

Specimen paper
for first assessment in October 2020

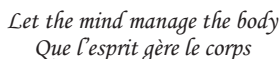
NCE – SCIENCE (BIOLOGY SECTION) SPECIFICATIONS

Topic/Content Strand	Question Number	Learning Outcomes (Syllabus)	Page No in Textbook Grade 9	Assessment Objectives									Total
				AO1: Knowledge with Understanding			AO2: Application			AO3: Scientific Inquiry and Problem Solving Skills			
				Basic	Intermediate	Proficient	Basic	Intermediate	Proficient	Basic	Intermediate	Proficient	
Transport in Animals	1(1)	B1.4	3	1									17
	1(2)	B1.2	9	1									
	1(3)	B1.7	21	1									
	4(a) (i)	B1.3	10				2						
	4(a) (ii)	B1.3	10					2					
	4(b) (i)	B1.6	13	1									
	4(b) (ii)	B1.5	15					1					
	4(b) (iii)	B5.4	14-15								1		
	4(b) (iv)	B5.4	14-15								1		
	4(c) (i)	B1.2	4				1						
	4(c) (ii)	B5.5	4								2		
	4(c)(iii)	B5.5	5							1			
	4(c) (iv)	B5.5	4-5								2		
Nutrition in Plants	1(4)	B4.6	15	1									13
	1(5)	B4.8	15	1									
	5(a) (i)	B5.2	22				1						
	5(a) (ii)	B4.9	22		1								
	5(a) (iii)	B4.2	25		1								
	5(a) (iv) 1.	B5.2	22								2		
	5(a) (iv) 2.	B5.3	38									2	
	5(a) (v)	B5.3	37-38								1		
	5(a) (vi)	B4.10	37									1	
	5(b)	B4.3	2-12		2								
Reproduction	1(6)	B2.2	5	1									11
	1(7)	B2.5	12				1						
	1(8)	B2.4	11	1									
	1(9)	B2.3	8	1									
	2(a)	B2.3	9	4									
	2(b)	B2.2	3-7	3									
Biodiversity	1(10)	B3.4	13				1						9
	3(a) (i)	B3.1	5	1									
	3(a) (ii)	B5.1	2	1									
	3(a) (iii)	B3.5	18	1									
	3(a) (iv)	B3.4	14	1									
	3(b) (i)	B3.4	8	1									
	3(b) (ii)	B3.4	9	1									
	3(c) (i)	B3.4	15-16	1									
	3(c)(ii)	B3.4	15-16				1						
Total marks				23	4	0	7	3	0	1	9	3	50
Total of the AOs					27			10			13		50
% of each AO					54			20			26		100

Basic: 62%

Intermediate: 30%

Proficient: 6%

[illegible]

Index Number:

NATIONAL CERTIFICATE OF EDUCATION

Specimen paper for first assessment in October 2020

SCIENCE (N 530)

BIOLOGY SECTION

TIME: 45 MINUTES

Additional Materials: Ruler

READ THESE INSTRUCTIONS FIRST

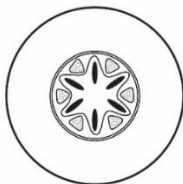
1. Write your Index Number in the space provided above.
2. Write in dark blue or black ink.
3. Answer **all** questions.
4. All answers must be written in the spaces provided.
5. You may use a soft pencil for any diagrams, graphs or rough working.
6. Any rough working should be done in this booklet.
7. Do not use correction fluid.
8. Calculators are not allowed.
9. The total of the marks for this paper is **50**.
The number of marks is given in brackets for each question or part question.
10. Check that this assessment booklet consists of **5** questions printed on **11** pages from pages 2 to 12.
11. Any discrepancy in the document must be immediately notified to the invigilator.

Question 1 (10 marks)

Circle the correct answer.

1. Which organ **pumps** blood to all parts of the body?
 - A** Heart
 - B** Liver
 - C** Lungs
 - D** Stomach
2. Which one of the following is a function of blood **platelets**?
 - A** They transport oxygen
 - B** They produce antibodies
 - C** They help in blood clotting
 - D** They transport digested food
3. Which one of the following can result in the development of **cardiovascular** diseases?
 - A** Mosquito bites
 - B** A diet high in fat
 - C** A diet high in vitamins
 - D** Physical exercises
4. Which one of the following diagrams shows vascular bundles in the cross-section of a **stem**?

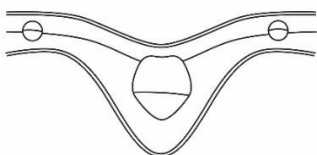
A



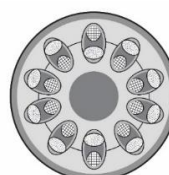
B



C



D



5. Which one of the following is a function of the **xylem** vessel in plants?
- A It transports food
 - B It transports water
 - C It transports oxygen
 - D It transports carbon dioxide
6. Which one of the following is the mode of reproduction of **yeasts**?
- A Laying eggs
 - B Giving birth to their young
 - C Forming small buds
 - D Splitting into 2 new cells
7. The table below shows the number of females with HIV/AIDS from 2014 to 2017 in Mauritius.

Year	Number of females with HIV/AIDS
2014	322
2015	262
2016	320
2017	369

- In which year was there the **smallest** number of females with HIV/AIDS?
- A 2014
 - B 2015
 - C 2016
 - D 2017
8. Which one of the following is an example of a **sexually transmitted disease**?
- A Cancer
 - B Diabetes
 - C Malaria
 - D Syphilis

9. **Fig. 1.1** shows the male reproductive system in humans.

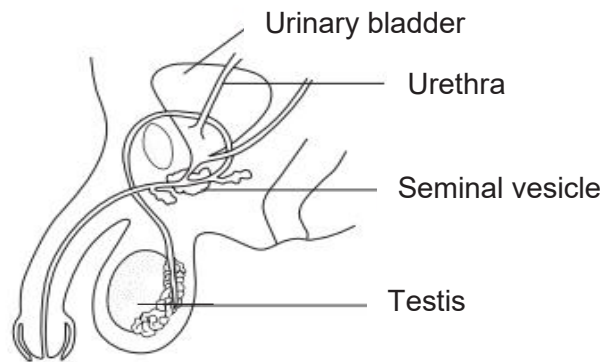


Fig. 1.1: Male reproductive system

In which part are the male **gametes** produced?

- A** Seminal vesicle
 - B** Testis
 - C** Urethra
 - D** Urinary bladder
10. **Fig. 1.2** shows some of the effects of human activity on a river.

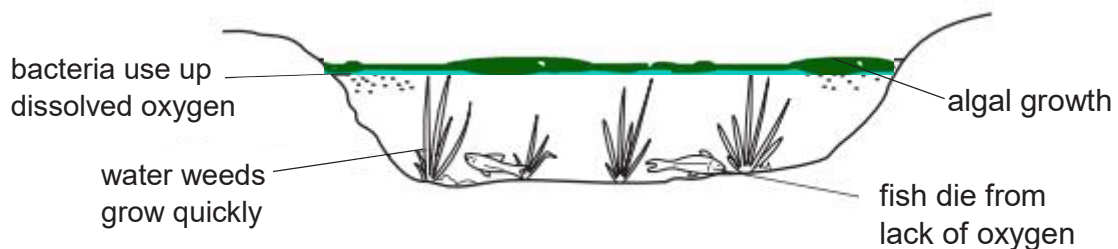


Fig. 1.2: Part of a river ecosystem

Which one of the following is the **direct** cause of these effects?

- A** Run-off of fertilisers
- B** Global warming
- C** Air pollution
- D** Oil spill

Question 2 (7 marks)

(a) **Fig. 2.1** shows part of the female reproductive system in humans.

On the diagram, **label** parts **A** to **D** using the appropriate word from the list below:

Fallopian tube, Ovary, Vagina, Uterus, Cervix

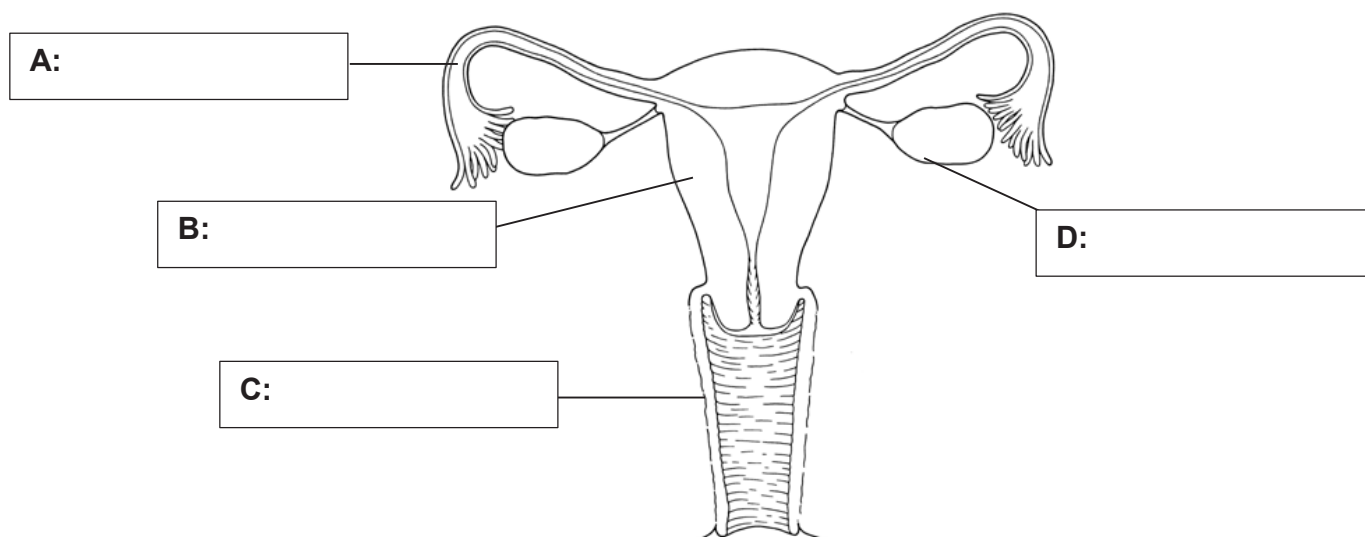


Fig. 2.1: Female reproductive system

[4]

(b) Put a tick [✓] or a cross [X] in each box to show the mode of reproduction of the different organisms given in the table below.

An example is done for you.

Organisms	Mode of reproduction	
	Asexual reproduction	Sexual reproduction
Humans	X	✓
Amoeba		
Spider plant		
Kestrel		

[3]

Question 3 (8 marks)

a) Fill in the blanks with the words provided from the list below:

conservation extinction biodiversity ecosystem erosion quadrat

- (i) The variety of plants and animals in a defined area is known as the area's _____.
- (ii) A _____ is used to estimate the number of organisms such as plants, algae or slow-moving animals in a defined area.
- (iii) The protection, restoration and management of natural resources is known as _____.
- (iv) Overfishing of fish such as the blue tuna can lead to the _____ of the species.

[4]

(b) **Fig. 3.1** shows the changes in native forest cover in Mauritius from 1638 to 1997.

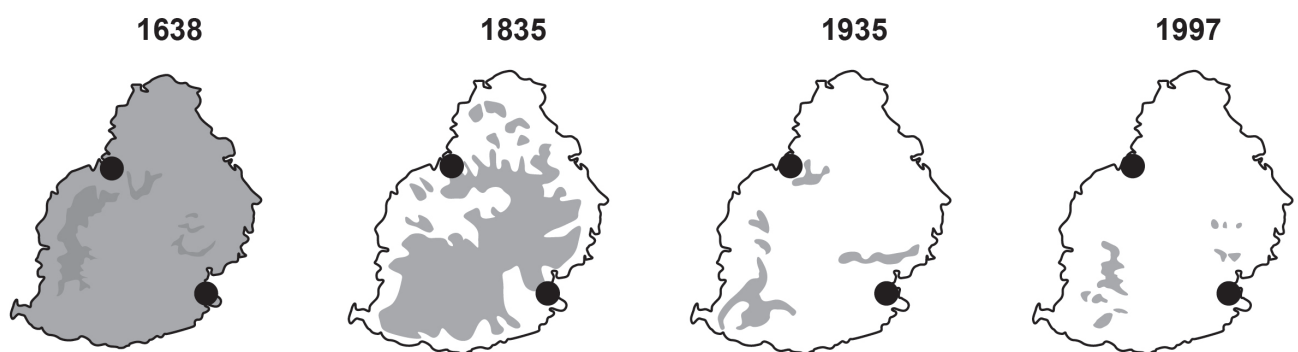


Fig. 3.1: Native forest cover

- (i) Name the process responsible for the changes in the forest cover over the years.

- (ii) Give one consequence of the decrease in the native forest cover.

[1]

[1]

(c) **Fig. 3.2** shows the growth of Chinese guava in the native forests of Mauritius.



Fig. 3.2: Chinese guava plants in Mauritius

Chinese guava plants compete directly with native plants for water, sunlight and space.

- (i) What is the name given to such exotic species of organisms which affect native organisms?

[1]

- (ii) Apart from competing for resources, give one other threat from such exotic plants.

[1]

Question 4 (14 marks)

(a) **Fig. 4.1** shows two types of blood vessels, **P** and **Q**, found in the human body.

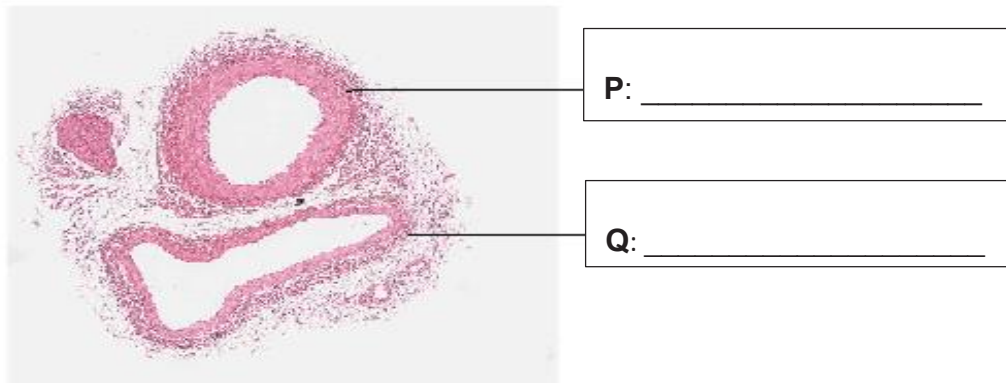


Fig. 4.1: Two types of blood vessels

(i) On **Fig. 4.1**, name blood vessels **P** and **Q**. [2]

(ii) Give two **visible** features on **Fig. 4.1** which help you to identify the two blood vessels.

1. _____

2. _____

[2]

(b) The table below shows the results of an experiment carried out on a student to find out how physical exercise affects his pulse rate.

Activity	Pulse rate/ min
Rest	75
30 steps-up	120

(i) Give one site on the body where a pulse can be felt.

[1]

(ii) Give the importance of an increased pulse rate during exercising.

[1]

- (iii) Explain why it is important to take the pulse of the student at rest first.

[1]

- (iv) What can be done to make sure that the **results** of this experiment are **correct**?

[1]

- (c) **Fig. 4.2** shows a blood smear as seen under the microscope.

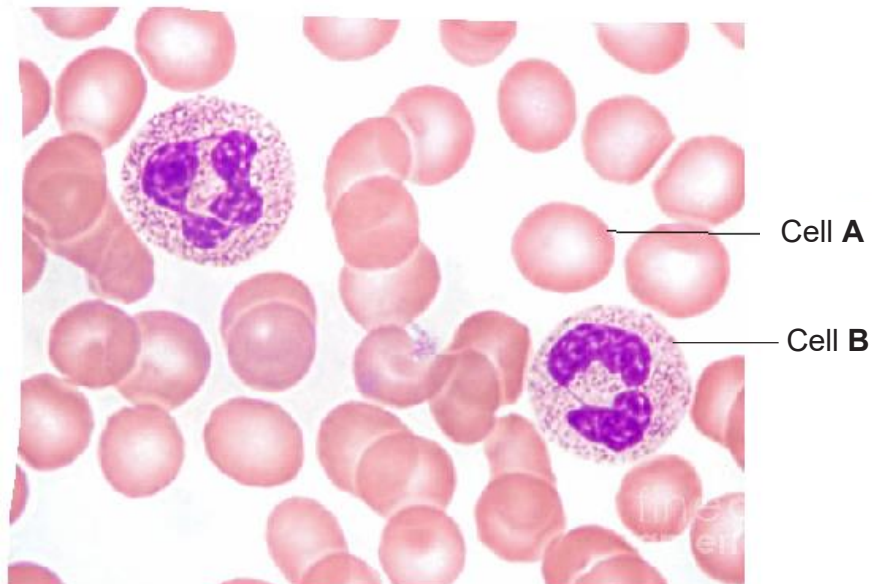
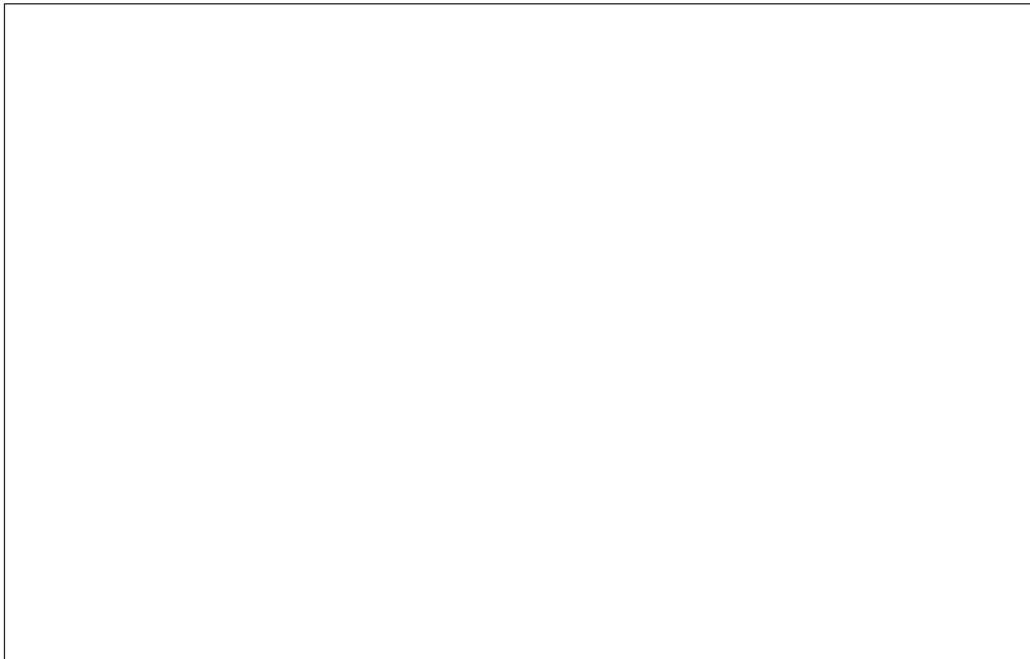


Fig. 4.2: Blood smear

- (i) Name cell A.

[1]

- (ii) Make a large drawing of cell **B** in the space below



[2]

- (iii) Measure the diameter of your drawing

Diameter of drawing = _____mm

[1]

- (iv) Calculate the magnification of your drawing compared to cell **B** in **Fig. 4.2**.

(Do not simplify your answer.)

Magnification of drawing = _____

[2]

Question 5 (11 marks)

- (a) Sabrina conducts an experiment to investigate a particular factor affecting the rate of photosynthesis in *Elodea* plants.

She places 3 lamps at different distances from 3 different plants:

Setup 1 - 15 cm away from the plant (as shown in **Fig. 5.1**);

Setup 2 - 30 cm away from the plant;

Setup 3 - 45 cm away from the plant.

She records the number of bubbles coming out from each of the 3 plants every 5 minutes.

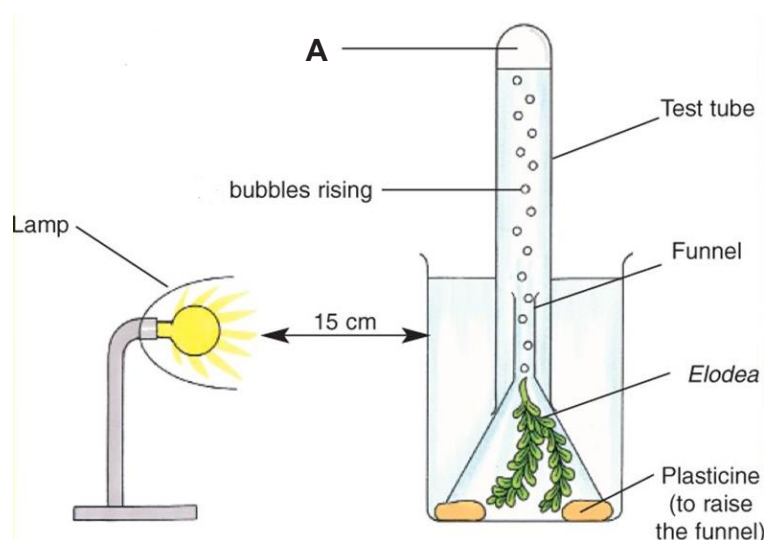


Fig. 5.1: Experiment on photosynthesis

- (i) Which gas is collected at **A** in **Fig. 5.1**?

[1]

- (ii) Which factor affecting photosynthesis is Sabrina investigating?

[1]

- (iii) Write down the word equation for photosynthesis.

[1]

(iv) **The table** below shows the data collected by Sabrina.

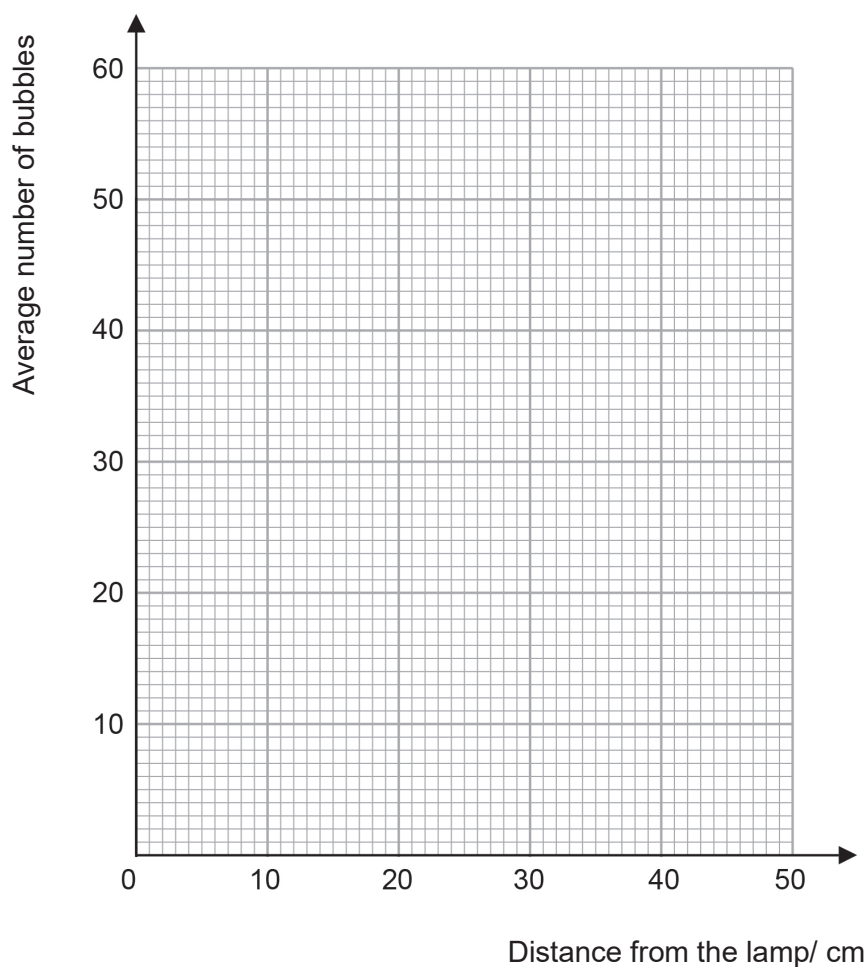
	Distance of lamp from the plant	No. of bubbles between 5 and 10 minutes	No. of bubbles between 10 and 15 minutes	Average No. of bubbles recorded for every 5 minutes
Setup 1	15 cm	54	56	55
Setup 2	30 cm	43	45	_____
Setup 3	45 cm	35	33	_____

1. In the table above, write down the **average** number of bubbles recorded every 5 minutes for each plant in setups **2** and **3**.

[2]

2. On the graph below, plot the average number of bubbles recorded over 5 minutes for each plant against the distance of the lamp from the plant. Draw a line to connect the plotted points.

[2]



- (v) Using the graph to help you, predict the results that the student would get if the lamp was positioned **20 cm** from the plant.

[1]

- (vi) Sabrina counted the number of bubbles to measure the amount of gas given off during photosynthesis.

Suggest one reason why counting bubbles is **not** an accurate way of measuring the amount of gas given off.

[1]

- (b) Photosynthesis occurs mainly in the leaves of plants.

Give **two** ways in which leaves are adapted for photosynthesis.

1.

2.

[2]

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MARK SCHEME

SCIENCE

Specimen paper Mark scheme
for first assessment in October 2020

NOTE:

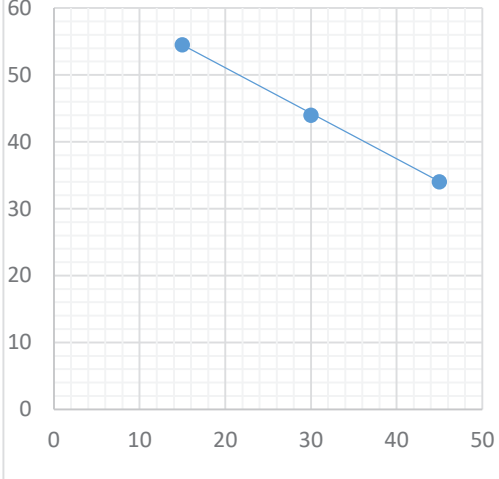
Mark schemes are prepared by the Assessment developers and considered, together with the relevant questions, by a panel of subject experts.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular assessment paper.

BIOLOGY																		
Question	Answer	Mark	Remark															
1	1. A 2. C 3. B 4. D 5. B 6. C 7. B 8. D 9. B 10. A	10 x 1 = 10 marks																
2 (a)	A – Fallopian tube B – Uterus C – Vagina D – Ovary	4 x 1 = 4 marks																
2 (b)	<table><tr><th rowspan="2">Organisms</th><th colspan="2">Mode of reproduction</th></tr><tr><th>Asexual reproduction</th><th>Sexual reproduction</th></tr><tr><td>Amoeba</td><td>✓</td><td>X</td></tr><tr><td>Spider plant</td><td>✓</td><td>✓</td></tr><tr><td>Kestrel</td><td>X</td><td>✓</td></tr></table>	Organisms	Mode of reproduction		Asexual reproduction	Sexual reproduction	Amoeba	✓	X	Spider plant	✓	✓	Kestrel	X	✓	3 x 1 = 3 marks		
Organisms	Mode of reproduction																	
	Asexual reproduction	Sexual reproduction																
Amoeba	✓	X																
Spider plant	✓	✓																
Kestrel	X	✓																
3 (a)	(i) biodiversity (ii) quadrat (iii) conservation (iv) extinction	4 x 1 = 4 marks																
3 (b) (i)	Deforestation	1 mark																
3 (b) (ii)	Accept the following ideas: - Loss of biodiversity - Soil erosion - Loss of endemic plants and animals	1 mark	Accept any other correct idea															

	<ul style="list-style-type: none"> - Imbalance in the amount of oxygen and carbon dioxide content in the air - Animals lose their food supply - Animal lose their natural habitats 		
3 (c) (i)	<ul style="list-style-type: none"> - Invasive alien species 	1 mark	
3 (c) (ii)	<p>Ideas on the following are acceptable:</p> <ul style="list-style-type: none"> - They can lead to a drop in native plants which may cause a decrease in other native organisms/fauna - They can affect the food chains and food webs - They can spread diseases 	1 mark	Accept any other correct idea
4 (a) (i)	<p>P: Artery</p> <p>Q: Vein</p>	2 x 1 = 2 marks	
4 (a) (ii)	<ul style="list-style-type: none"> - Thickness of wall. - Size of lumen. 	2 x 1 = 2 marks	Accept only visible features
4 (b) (i)	<ul style="list-style-type: none"> - Base of thumb in the region of the wrist - Neck (carotid artery) - At the groin (femoral artery) - Near the ankle joint - Foot 	1 mark	Accept any correct answer
4 (b) (ii)	<ul style="list-style-type: none"> - For an increased supply of oxygen and nutrients to muscle tissues for respiration 	1 mark	Accept any correct idea
4 (b) (iii)	<ul style="list-style-type: none"> - To be able to compare the results. - To understand how physical exercises affect the pulse rate. 	1 mark	Accept any other correct idea
4 (b) (iv)	<p>Accept any of the following ideas:</p> <ul style="list-style-type: none"> - Repeat the experiment after some time - Make sure that the pulse rate is well counted - Make sure to use a stopwatch to record the pulse rate - Take an average of the pulse rate before and after exercising. 	1 mark	Accept any other correct idea

4 (c) (i)	Red blood cell	1 mark	
4 (c) (ii)	<ul style="list-style-type: none"> - Large drawing made - No overlapping lines/ Clear line drawing - The nucleus is well drawn/ idea of lobed nucleus 	2 marks	Give 1 mark if there are overlapping lines or if the nucleus is not well shown
4 (c) (iii)	Diameter correctly measured in mm	1 mark	
4 (c) (iv)	Magnification of drawing = $\frac{\text{Diameter of drawing}}{\text{Diameter of cell B in Fig 4.2}}$	2 marks	1 mark for correct formula (formula written or measurements used) 1 mark for correct answer (approximation can be used)
5 (a) (i)	Oxygen	1 mark	
5 (a) (ii)	Light intensity on photosynthesis	1 mark	Accept light
5 (a) (iii)	$\text{Carbon dioxide + Water} \xrightarrow[\text{Chlorophyll}]{\text{Sunlight}} \text{Glucose + Oxygen}$	1 mark	All elements should be given for the mark except for sunlight and chlorophyll
5 (a) (iv) 1.	Correct average – 44 and 34	2 marks	1 mark for each correct average

5 (a) (iv) 2.		2 marks	1 mark for the correct plotting 1 mark for the line drawn connecting the plotted points
5 (a) (v)	50 - 52	1 mark	Answer according to the graph of the candidate
5 (a) (vi)	Accept any of the following ideas: <ul style="list-style-type: none"> - The bubbles are of different sizes - The bubbles can be given off too quickly for an accurate count to be made. 	1 mark	Accept any correct answer
5 (b)	<ul style="list-style-type: none"> - They contain chlorophyll to trap light. - They have a large surface area to capture light - They are very thin thus enabling rapid diffusion to take place - They contain pores/stomata for gas exchange - They contain vascular bundles for the transportation of food and gases 	1 mark for each correct answer	Accept any other correct answers

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