This is a Class 1 exam

Lebanon Evangelical School for Boys and Girls

Lebanon Evangelical School

for Boys and Girls Loueizeh - Baabda

Stage Exam 04

27MAR2023

Do NOT write in this box. Your MARK will be placed here.

Subject :	Biology
Class :	9A
Teacher :	Rahmeh Hilal
Duration :	1 hour

Your name :		*Time taken to complete exam*
Your Class :		
Exam Room :		
How many sheets, including cover sheet :		

- Do not open this paper until the teacher in charge instructs you to do so.
- The most important thing to remember in taking an exam is NEVER PANIC.
- If you are caught cheating in this exam, you will be awarded zero for ALL exams that are taken on this day.

Q1.

Blood clotting is an important process in humans.

The process is controlled by enzymes.

(a) (i) Give two reasons why blood clotting is important.

(2)

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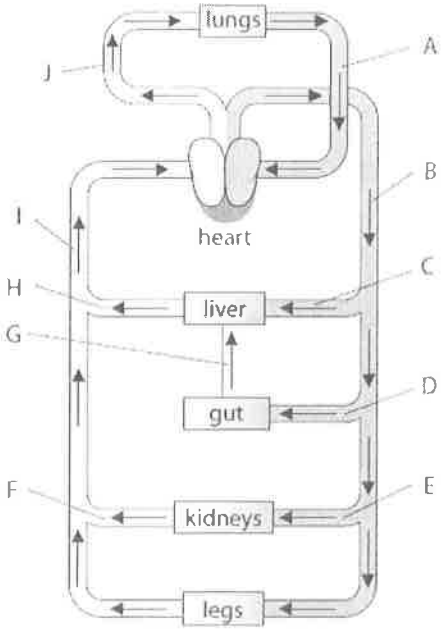
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(Total for question = 2 marks)

Q2.

The diagram shows the human circulation system with some blood vessels labelled A to J. The arrows show the direction of blood flow.



(a) The table gives some statements about the content of blood vessels in this circulation system.

(i) Complete the table by giving the letter of the blood vessel that matches each statement.

(5)

Statement	Letter
contains the least carbon dioxide	
contains the most glucose after a meal	
contains the least oxygen	
contains the least urea	
contains blood at the highest pressure	

(ii) State two ways in which the structure of blood vessel A differs from the structure of blood vessel J.

(2)

1 .....

2 .....

(b) Muscles in the legs contain capillaries.

A scientist investigates how long-term training affects the number of capillaries in an athlete's leg muscles.
The scientist determines the mean number of capillaries per mm^2 in samples of leg muscle from the athlete before and after a period of training.
The table shows the scientist's results.

Muscle sample	Mean number of capillaries per mm^2
before training	313
after training	349

The scientist concludes that training improves the athletic performance.
Discuss this conclusion.

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(Total for question = 12 marks)

Q3.

Blood consists of cells and plasma.

(a) Plasma transports various substances to and from different parts of the body.

Describe the function of plasma in transporting named substances in the body.

(4)

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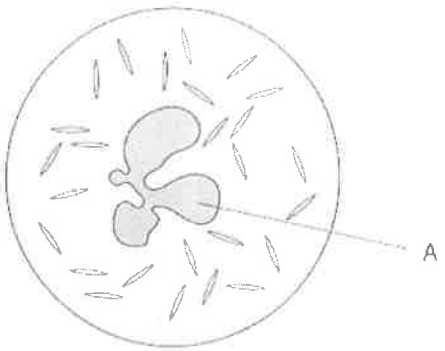
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(b) The diagram shows a white blood cell called a phagocyte.



(i) The magnification of the cell is calculated using this formula.

$$\text{magnification} = \frac{\text{diameter of cell in diagram}}{\text{actual diameter of cell}}$$

The actual diameter of the cell is 0.013 mm.
Calculate the magnification of the cell.

(2)

magnification = ...

(ii) Name the structure labelled A in the diagram.

(1)

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(iii) Describe the function of this cell in defending the body from infection.

(2)

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(c) Other white blood cells produce proteins called antibodies.

State how you could test a sample of plasma for protein.

(1)

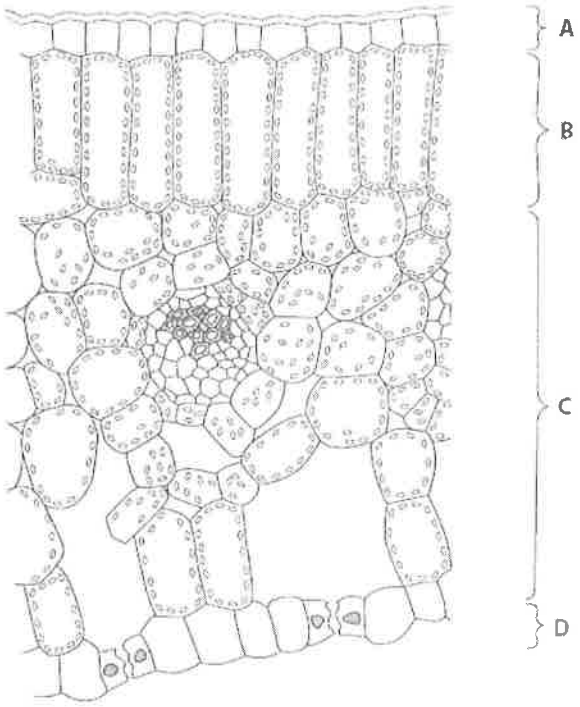
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(Total for question = 10 marks)

Q4.

The diagram shows a cross-section through a leaf.



(a) (i) Which layer contains palisade mesophyll cells?

- ☐ **A**
- ☐ **B**
- ☐ **C**
- ☐ **D**

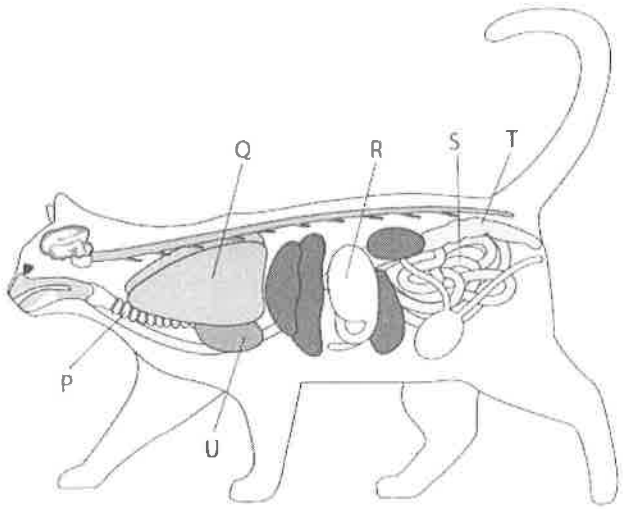
(ii) Which set of environmental conditions would produce the fastest rate of transpiration from this leaf?

	Humidity	Temperature
☐ **A**	High	High
☐ **B**	High	Low
☐ **C**	Low	High
☐ **D**	Low	Low

Q5.

Some questions must be answered with a cross in a box ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

The diagram shows the internal anatomy of a cat with some organs labelled.



(Source: VectorMine / Shutterstock)

(a) One of the organs labelled is part of the circulation system.

Which of these structures is part of the circulation system?

(1)

- ☐ **A** structure P
- ☐ **B** structure R
- ☐ **C** structure S
- ☐ **D** structure U

(b) Ventilation and gas exchange take place in the cat's lungs.

The movement of air into the lungs is caused by the movement of the rib cage and the diaphragm.
Which of these makes the cat breathe in?

(1)

- ☐ **A** diaphragm contracts and the volume within the rib cage decreases
- ☐ **B** diaphragm contracts and the volume within the rib cage increases
- ☐ **C** diaphragm relaxes and the volume within the rib cage decreases
- ☐ **D** diaphragm relaxes and the volume within the rib cage increases

(c) The table gives some information about the composition of inhaled air and exhaled air.

It compares the volumes of three gases in inhaled air and in exhaled air.

Gas	Volume of gas in one litre of inhaled air in cm^3	Volume of gas in one litre of exhaled air in cm^3
oxygen	200	160
carbon dioxide	0.4	40
nitrogen	790	790

(i) Determine which gas shows the greatest percentage change from its volume in inhaled air to its volume in exhaled air.

(2)

(ii) Explain the differences between the composition of inhaled air and exhaled air shown in the table.

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(iii) Explain how the structure of the lungs is adapted for efficient gas exchange.

(4)

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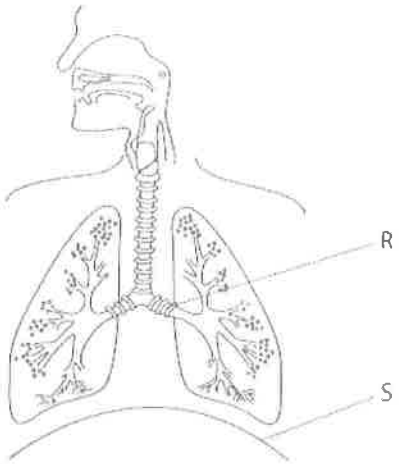
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(Total for question = 12 marks)

Q6.

(a) The diagram shows part of a human thorax with structures labelled R and S.



(i) What is the name of structure R?

(1)

- ☐ **A** bronchiole
- ☐ **B** bronchus
- ☐ **C** oesophagus
- ☐ **D** trachea

(ii) Explain how changes in structure S enable a person to breathe in.

(3)

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Q7.

Transpiration is the evaporation of water from the surface of a plant.

Explain why transpiration is useful for plants.

(2)

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(Total for question = 2 marks)

Q1.

Question Number	Answer	Mark
(a)(i)	An answer that makes reference to the following points: • prevent loss of blood / stops bleeding (1) • prevent entry of pathogens / microbes / bacteria / viruses / fungi / eq / prevent infections (1)	2 grad

Q2.

Question Number	Answer	Mark
(a)(i)	<table><tr><th>statement</th><th>letter</th></tr><tr><td>contains the least carbon dioxide</td><td>A</td></tr><tr><td>contains the most glucose after a meal</td><td>G</td></tr><tr><td>contains the least oxygen</td><td>J</td></tr><tr><td>contains the least urea</td><td>F</td></tr><tr><td>contains blood at the highest pressure</td><td>B</td></tr></table>	5

Question Number	Answer	additional guidance	Mark
(a)(ii)	An answer that makes reference to two of the following points: A / pV has • thin(ner) wall (1) • <u>less</u> muscle (1) • <u>less</u> elastic tissue (1) • wide(r) / big(er) / lumen (1)	allow converse for J allow thin allow wide ignore ref to valves	2

Question Number	Answer	Mark
(b)	An answer that makes reference to five of the following points: • more (capillaries to transport) oxygen / glucose (1) • more (aerobic) respiration / less anaerobic respiration (1) • more ATP/ more energy (1) • (more) muscle contraction (1) • less lactic acid (1) • effective for long distance events / ineffective for power events / type of performance not specified /only leg muscle sampled / eq(1) • other factor(s) / age / lung (capacity) / heart (rate) named other factors affect performance (1) • need to test more than one person / not repeated / eq (1)	5
		Total 12 marks

Q3.

Question Number	Answer	Mark
(a)	An explanation that makes reference to four of the following points: • glucose (transported) from intestine / ileum / liver / glucose (transported) to body cells / to liver (1) • amino acids (transported) from ileum / liver / amino acids (transported) to body cells / liver (1) • fatty acids / vitamins / minerals / eq (transported) from intestine / fatty acids / vitamins / minerals / eq (transported) to cells (1) • hormones (transported) from (endocrine) glands / hormones (transported) to organs / tissues (1) • urea (transported) from liver / urea (transported) to kidney (1) • carbon dioxide (transported) from cells / carbon dioxide (transported) to lungs (1) • antibodies (transported) to site of infection / eq (1) • fibrinogen / clotting proteins (transported) to wound / eq (1)	4

Question Number	Answer	Additional guidance	Mark
(b)(i)	• measurement of diagram = 58 mm / 5.8 cm • divide diagram measurement in mm by 0.013 • answer 4462 (2)	Award full marks for correct numerical answer without working Accept answers between 4307 to 4616 Award one mark for 56 mm up to 60 mm or 5.6 cm up to 6.0 cm or award one mark for a division by 0.013	2

Question Number	Answer	Mark
(b)(ii)	• nucleus (1)	1

Question Number	Answer	Mark
(b)(iii)	An answer that makes reference to • engulf / ingest / eq bacteria / pathogen / microbe / eq (1) • digest / break down (1) • enzymes (1)	2

Question Number	Answer	Mark
(c)	An answer that makes reference to Biuret / add NaOH and CuSO4 / albustix /eq (1)	1
		Total 10 marks

Q4.

Question Number	Answer	Additional guidance	Mark
(a)(i)	**B is the correct answer** A is incorrect as there are no palisade cells present C is incorrect as there are no palisade cells present D is incorrect as there are no palisade cells present		1

Question Number	Answer	Additional guidance	Mark
(a)(ii)	**C is the correct answer (low humidity high temperature)** A is incorrect because high humidity would reduce transpiration B is incorrect because high humidity would reduce transpiration D is incorrect because low temperature would reduce transpiration		1

Q5.

Question Number	Answer	Mark
(a)(ii)	The only correct answer is D structure U A is not correct as P is not part of circulation system B is not correct as R is not part of circulation system D is not correct as S is not part of circulation system	1

Question Number	Answer	Mark
(b)	The only correct answer is B diaphragm contracts and the volume within the rib cage increases A is not correct as volume within the rib cage does not decrease C is not correct as diaphragm does not relax D is not correct as diaphragm does not relax	1

Question Number	Answer	Additional guidance	Mark
(c)(i)	• oxygen 20% (1) • carbon dioxide 9900% (1)	(40/200) x 100 = 20% (39.6/0.4) x 100 = 9900 one mark for each correct %	2

Question Number	Answer	Mark
(c)(ii)	An explanation that makes reference to four of the following points: • more carbon dioxide in exhaled air / eq (1) • as produced by / released from respiration (in cells) (1) • transported in (red cells and plasma) to lungs / eq (1) • less oxygen in exhaled air / eq (1) • as absorbed by red blood cells / absorbed by lungs / eq (1) • as used / required in respiration (in cells) (1) • little change/ no change in Nitrogen (as not absorbed / not required) (1)	**4**

Question Number	Answer	Mark
(c)(iii)	An explanation that makes reference to four of the following points • (many) alveoli provide large surface area /eq (1) • blood flow / blood supply / capillaries / maintain(s) diffusion / concentration gradient / eq (1) • capillaries provide blood supply / surround / close to alveoli/ eq (1) • thin (walls) one cell thick / short distance for diffusion eq (1) • moist lining to allow gases to dissolve / pass through / for gas exchange /eq (1)	**4**

Q6.

Question Number	Answer	Additional guidance	Mark
(a)(i)	B (bronchus) is the only correct answer A is incorrect as bronchioles have no cartilage B is incorrect as oesophagus leads to stomach C is incorrect as there is only one trachea		**1**

Question Number	Answer	Additional guidance	Mark
(a)(ii)	An explanation that makes reference to three of the following: • (S / (diaphragm)/ it) contracts (1) • flattens / presses down / moves down / less dome shaped / eq (1) • increases volume (1) • decreases pressure / air flows in down pressure gradient / eq (1)	**Ignore** more space **Allow** low pressure	3

Q7.

Question Number	Answer	Additional guidance	Mark
(a)	An explanation that makes reference to the following points: • draws water up (to leaves) / enables water to be taken up (by roots) (1) • cooling (1) • (transport) minerals / named mineral (1) • prevent wilting / eq (1) • (water for) photosynthesis (1)	**Allow** maintain turgidity	2