This is a Class 1 exam

Lebanon Evangelical School
for Boys and Girls Loueizeh - Baabda

Stage Exam 05
27APR2026

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

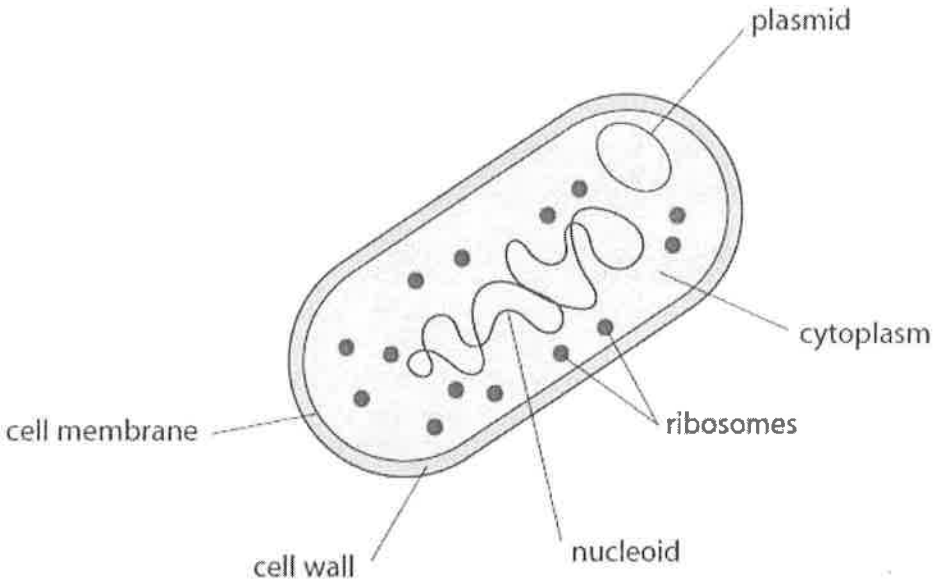
Subject :	Biology	
Class :	9A	
Teacher :	Miss Rahmeh Hilal	
Duration :	1 hour	
Your name :		*Time taken to complete exam*
Your Class :		
Exam Room :		
How many sheets, including cover sheet :		

- 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.

P. multocida is a bacterium that causes cholera in chickens.

The diagram shows the bacterium.



(a) Give two structures in this bacterium that are also found in all eukaryotic cells.

(2)

1.....

2.....

(b) Scientists investigated the survival of chickens injected with normal *P. multocida* or with weakened *P. multocida*.

The table shows the scientists' results.

Type of injection	Result
normal *P. multocida*	chickens die
weakened *P. multocida*	chickens stay alive

(i) What is a correct conclusion about *P. multocida* from these results?

(1)

- ☐ **A** they are decomposers
- ☐ **B** they are pathogens
- ☐ **C** they are microscopic
- ☐ **D** they are non-living

(ii) The scientists took the living chickens that had been injected with weakened *P. multocida* and then injected them with normal *P. multocida*.
The chickens did not die, as they were now immune.
Explain why these chickens did not die.

(4)

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(Total for question 1 = 7 marks)

Q2.

A study investigates the effect of training on athletic performance.

In the study, the number of capillaries in the muscle tissue of a person is measured before and after a six-week period of training.

(a) The table shows the results.

Mean number of capillaries per mm^2	
before training	after training
437	460

Explain how training may affect the athletic performance of this person. Use information from the table to support your answer.

(5)

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(b) The diameter of a capillary is 8.0 μm and the diameter of the aorta is 25.0 mm.

1000 μm = 1 mm.

(i) Calculate the ratio of the diameter of the aorta to the diameter of the capillary. Show your working

(2)

ratio = ...

(ii) Explain why the aorta has a thicker wall than the capillary.

(2)

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(Total for question 2 = 9 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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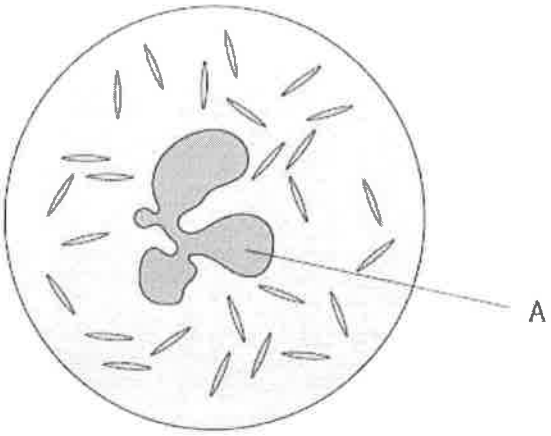
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(b) The diagram shows a white blood cell called a phagocyte.



(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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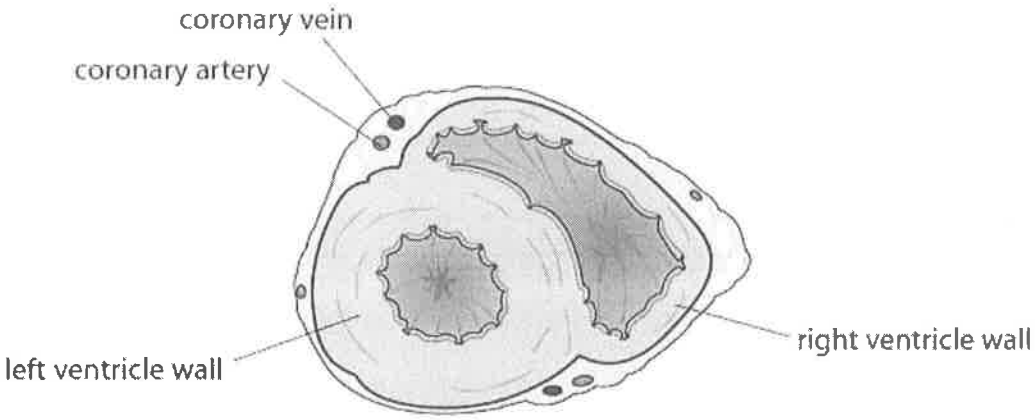
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(Total for question 3 = 9 marks)

Q4.

The diagram shows a transverse section through a human heart.



(a) (i) Draw an X on the diagram to show the position of the septum.

(1)

(ii) State two differences between the composition of the blood in the coronary artery and the composition of the blood in the coronary vein.

(2)

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(iii) Explain the differences between the left ventricle wall and the right ventricle wall.

(3)

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(b) The development of coronary heart disease is linked to a number of factors.

Explain how these factors can increase the risk of developing coronary heart disease.

(4)

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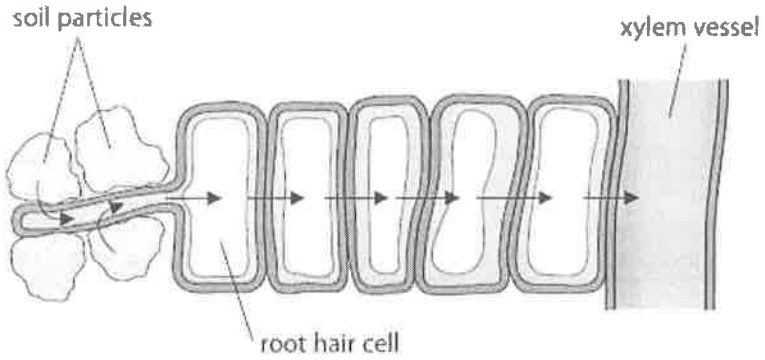
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(Total for question 4 = 10 marks)

Q5.

The diagram shows the path that the water takes when it is absorbed from the soil into the xylem of a plant.



(a) Explain how root hair cells are adapted for efficient absorption of water.

(2)

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(b) Explain how water is transported from the soil to the leaves.

(4)

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(Total for question 5 = 6 marks)

Q6.

Phagocytes and lymphocytes are white blood cells involved in the immune response.

(a) Explain the role of lymphocytes in the immune response.

(3)

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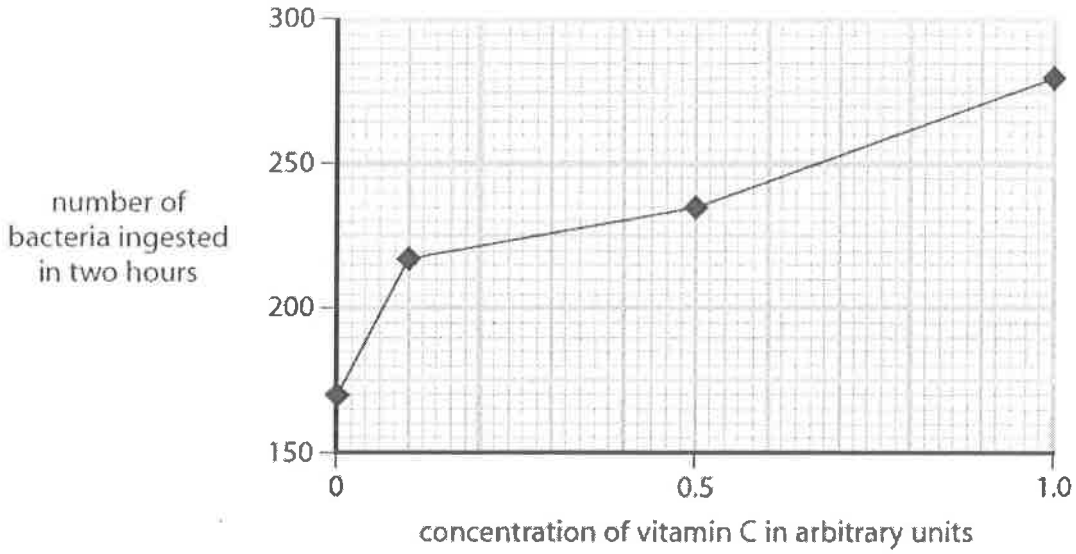
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(b) A scientist uses this method to investigate how vitamin C affects ingestion of bacteria by phagocytes.

- add different concentrations of vitamin C solution to three test tubes
- add distilled water to a fourth test tube
- add phagocytes to each tube
- leave the tubes for one day
- add 10 cm^3 of a culture of non-pathogenic bacteria to each tube
- keep each tube at 35 °C for two hours
- measure the number of bacteria ingested

The graph shows the scientist's results.



(i) Which of these is the rate of ingestion of bacteria in the control?

(1)

- ☐ **A** 85 per hour
- ☐ **B** 140 per hour
- ☐ **C** 170 per hour
- ☐ **D** 280 per hour

(ii) The scientist concludes that vitamin C in a person's diet will protect people from pathogens. Comment on this conclusion.

(4)

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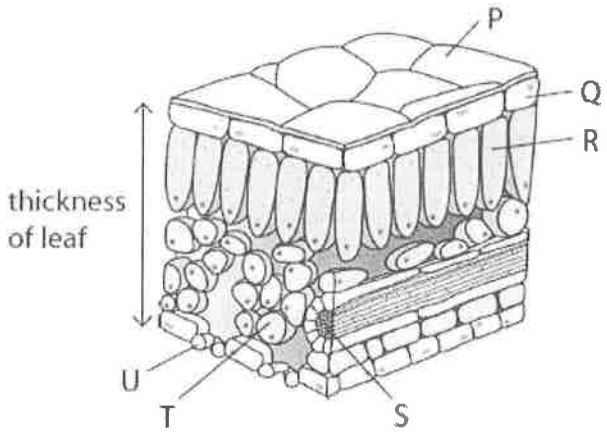
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(Total for question 6 = 8 marks)

Q7.

The diagram shows a section through a leaf with different parts labelled P to U.



(a) (i) Which part of the leaf transports amino acids?

(1)

☐ **A** R
☐ **B** S
☐ **C** T
☐ **D** U

(ii) Which part absorbs the most sunlight?

(1)

☐ **A** P
☐ **B** Q
☐ **C** R
☐ **D** S

(iii) Which part transports the products of photosynthesis?

(1)

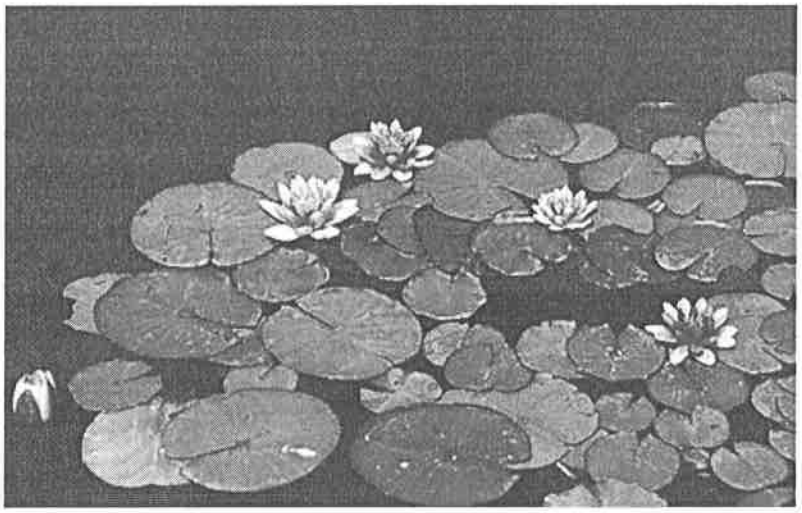
☐ **A** Q
☐ **B** R
☐ **C** S
☐ **D** T

(iv) Which part reduces the amount of water escaping?

(1)

☐ **A** P
☐ **B** Q
☐ **C** R
☐ **D** S

(b) The photograph shows water lilies, plants that float on the surface of ponds.



Suggest why the leaves of the water lily only have stomata on their upper surface.

(2)

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(Total for question 7 = 6 marks)

Total for paper = 55 marks

Q1.

Question Number	Answer	Mark
(a)	An answer that makes reference to two of the following points: • cytoplasm (1) • ribosomes (1) • cell membrane (1) • DNA (1)	**2**

Question Number	Answer	Mark
(b)(i)	The only correct answer is B bacteria are pathogens *A is not correct because it is not possible to conclude that the bacteria are decomposers* *C is not correct because it is not possible to conclude that the bacteria are microscopic* *D is not correct because it is not possible to conclude that the bacteria are non-living*	**1**

Question Number	Answer	Mark
(b)(ii)	An answer that makes reference to two of the following points: • vaccination / inoculated (1) • (same) antigens / (same) protein (on bacteria) (1) • secondary immune response (1) • memory cells (1) • (make) large numbers antibodies / (make) antibodies produced fast / soon / eq (1)	**4**
		Total = 7 marks

Q2.

Question number	Answer	Mark
(a)(i)	An explanation that makes reference to the following five points: • training improves performance by increasing the number of capillaries (1) • better supply of oxygen/aerobic (1) • better supply of glucose (1) • respiration/energy/ATP (1) • muscle contraction (1) • better removal of lactic acid/carbon dioxide (1) • can run for longer/equivalent (1)	5

Question number	Answer	Additional guidance	Mark
(b)(i)	Multiplication • 0.008 (1) Division • 25 ÷ 0.008 = 3125 = 3100 (1)	award full marks for correct numerical answer without working accept 3125 the final answer should reflect the precision of the least precise data (in this case two sig figs)	2

Question number	Answer	Additional guidance	Mark
(b)(ii)	An explanation that makes reference to two of the following points: • wall contains muscle/elastic tissue (1) • blood is under high pressure from the left ventricle (1) • aorta needs to expand (1) • need to transport more blood (1)	allow converse	2

Q3.

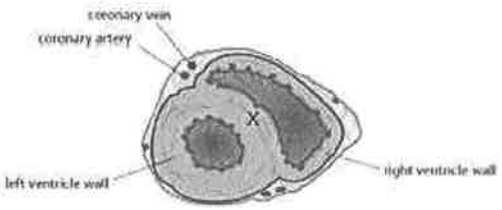
Question Number	Answer	Mark
(a)	An explanation that makes reference to four of the following points: • glucose (transported) from intestine / ileum / liver / glucose (transported) to body cells / to liver (1) • amino acids (transported) from ileum / liver / amino acids (transported) to body cells / liver (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

Q4.

Question Number	Answer	Mark
(a)(i)		1

Question Number	Answer	additional guidance	Mark
(a)(ii)	An answer that makes reference to the following • coronary artery contains (more) oxygen / oxygenated (1) • coronary artery contains less carbon dioxide / no carbon dioxide (1)	No credit for pressure vein no / less oxygen / deoxygenated vein (more) CO_2	2

Question Number	Answer	additional guidance	Mark
(a)(iii)	An explanation that makes reference to three of the following • (left wall) much thicker / eq (1) • more muscle / muscular (tissue) / eq (1) • (generates) more pressure / more force / eq (1) • pumps blood (all) around body / eq (1)	allow converse for each mp thinner less muscle less pressure /force ignore withstands pressure to lungs thicker muscle = mp1 and mp 2	3

Question Number	Answer	additional guidance	Mark
(b)	An explanation that makes reference to four of the following 1. genetics / inheritance / some people inherit increased risk from parents eq (1) 2. high blood pressure (puts more strain on heart) / eq (1) 3. high fat diet / lipid / cholesterol / (blocks coronary artery walls) / eq (1) 4. smoking (raises blood pressure and increase chances of clots) / eq (1) 5. stress (raises blood pressure) / eq (1) 6. lack of exercise , (exercise reduces blood pressure and strengthens heart) / eq (1) 7. obesity / being overweight / diabetes (increase strain on heart) / eq (1)	allow converse for each mp Ign bad diet unqalified	4
			Total 10 marks

Q5.

Question Number	Answer	Additional guidance	Mark
(a)(i)	A description that makes reference to two of the following points: • elongated / pointed / projections / extensions /eq (1) • increase surface area (1) • thin wall for short diffusion path / eq (1) • concentrated cell sap for osmosis / eq (1)	**Allow** low water potential to increase gradient for osmosis / increase water potential gradient /eq	**2 grad**

Question Number	Answer	Additional guidance	Mark
(a)(ii)	An explanation that makes reference to four of the following points: • water enters (root) by osmosis (1) • from dilute solution to more concentrated solution / eq (1) • (water) enters / moves up xylem (1) • water pulled up to leaf due to transpiration / pulled along transpiration stream / eq (1) • (water vapour) exits through stomata (1)	**Allow** from higher water potential to lower water potential **Allow** from high concentration of water to low concentration of water **Allow** water pulled due to evaporation from leaf / eq	**4 exp**

Q6.

Question Number	Answer	Mark
(a)	An explanation that makes reference to three of the following points: • antibodies (1) • specific (1) • antigens / foreign / invading cells/ bacteria / virus /pathogen / eq (1) • attach to / clump / kill / destroy pathogens / make memory cells (1)	3

Question Number	Answer	Mark
(c)(i)	Only A is correct as 85 per hour is the rate of ingestion of bacteria in the control *B is incorrect as the rate is not this per hour* *C is incorrect as the rate is not this per hour* *D is incorrect as the rate is not this per hour*	1

Question Number	Answer	Additional Guidance	Mark
(c)(iv)	An explanation that makes reference to the following points: • vitamin C increases ingestion (by phagocytes) / digested / killed / removed (1) • only done once / not reliable / not repeated (1) • done in vitro / in test tube / not in human / body (1) • need to test with other bacteria / bacteria that are pathogenic / may not work with other bacteria / species (1) • not all pathogens are bacteria / some pathogens are virus /eq (1) • not done at 37°C / not done at body temp / eq (1)	**Ignore** done at 35 °C	4

Q7.

Question Number	Answer	Mark
(a) (i)	Only B is correct as this transports amino acids *A is incorrect as this does not transport amino acids* *C is incorrect as this does not transport amino acids* *D is incorrect as this does not transport amino acids*	1

Question Number	Answer	Mark
(a) (ii)	Only C is correct as this absorbs most sunlight *A is incorrect as this does not absorb most sunlight* *B is incorrect as this does not absorb most sunlight* *D is incorrect as this does not absorb most sunlight*	1

Question Number	Answer	Mark
(a) (iii)	Only C is correct as this transports the products of photosynthesis *A is incorrect as it does not transport the products of photosynthesis* *B is incorrect as it does not transport the products of photosynthesis* *D is incorrect as it does not transport the products of photosynthesis*	1

Question Number	Answer	Mark
(a)(iv)	Only A is correct as it reduces water loss *B is incorrect as it does not reduce water loss* *C is incorrect as it does not reduce water loss* *D is incorrect as it does not reduce water loss*	1

Question Number	Answer	Mark
(d)	An answer that makes reference to two the following points: • lower surface in water / upper in air / stomata would be in water / eq (1) • (stomata) able to absorb CO_2 / gases (by diffusion) / allows gas exchange (1) • (stomata) able to lose water (by transpiration / evaporation) / to allow transpiration (1)	2