This is a Class 1 exam

Lebanon Evangelical School
for Boys and Girls
Loueizeh - Baabda

Stage Exam 05

Monday 09MAY2022

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

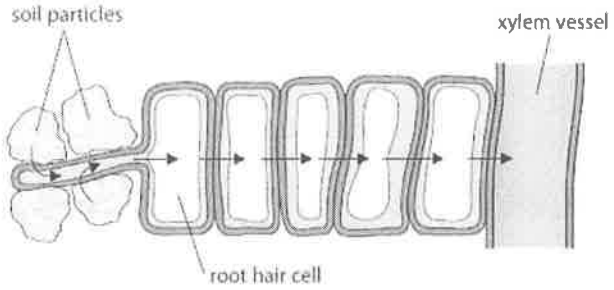
Subject :	Biology
Class :	9A
Teacher :	Miss Rahmeh Hilal
Duration :	1 hour

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.

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



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

(2)

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

(4)

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(Total for question = 6 marks)

Q2.

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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(b) Phagocytes ingest bacteria.

Explain what happens to bacteria after they have been ingested by phagocytes.

(3)

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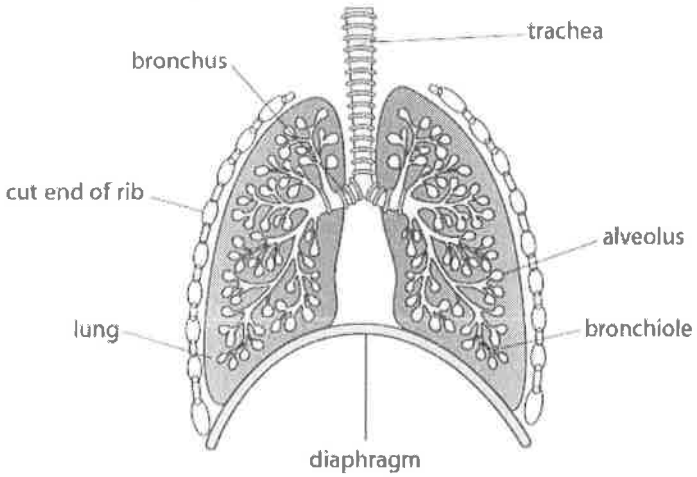
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(Total for question = 6 marks)

Q3.

The human thorax contains the lungs.

The diagram shows a section through the human thorax.



(a) The diaphragm is made of

(1)

- ☐ **A** blood
- ☐ **B** bone
- ☐ **C** elastic
- ☐ **D** muscle

(b) Describe the role of the intercostal muscles and the diaphragm when breathing in.

(4)

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(c) Oxygen diffuses into the blood from the alveoli.

The oxygen diffuses a distance of 0.00025 mm.
What is 0.00025 in standard form?

(1)

- ☐ **A** 2.5×10^{-4}
- ☐ **B** 2.5×10^{4}
- ☐ **C** 25×10^{-4}
- ☐ **D** 25×10^{4}

(d) The table gives the total surface area of alveoli and the respiration rate of a cat and of a mouse.

Animal	Total surface area of alveoli in m^2	Respiration rate in cm^3 per minute
cat	10.00	60.0
mouse	0.08	1.0

Explain the relationship between total surface area of alveoli and respiration rate in these animals.

(2)

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(Total for question = 8 marks)

Q4.

Human populations are at risk from infectious disease.

Explain how vaccination protects humans from pathogens.

(3)

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(Total for question = 3 marks)

Q5.

List 4 things that can be transported in the blood plasma.

(5)

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(Total for question = 5 marks)

Q6.

Red blood cells are responsible for transporting oxygen through the body.

(a) Name the molecule responsible for carrying oxygen in the blood.

(1)

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(b) Where exactly is it found?

(1)

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(c) What type of biological molecule is it?

(1)

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(d) Describe how that molecule gets its job done.

(3)

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(Total for question = 6 marks)

Q7.

The main role of platelets is forming blood clots.

(a) What are the 2 important functions of blood clotting?

(2)

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(b) Fibrinogen in the blood plasma is eventually converted to an insoluble fibrous protein. Name that protein and briefly describe how it results in a blood clot.

(3)

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(Total for question = 5 marks)

Q8.

Stomata are the site of gas exchange in plants. They open during the day when there is lots of light and close during the night.

Explain what allows the stomata to open and close.

(4)

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(Total for question = 4 marks)

Q1.

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**

Q2.

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
(b)	An explanation that makes reference to the following points: • killed / destroyed (1) • digested / broken down (1) • by enzymes / named enzyme (1) • products absorbed (by phagocyte) (1)	3

Q3.

Question Number	Answer	Mark
(a)	D muscle *A is incorrect because it is not blood* *B is incorrect because it is not bone* *C is incorrect because it is not elastic*	**1 comp**

Question Number	Answer	Additional guidance	Mark
(b)	A description that makes reference to the following points: • contraction (of muscle) (1) • diaphragm moves down / flattens (1) • ribs move up/out (1) • increase volume in thorax (1) • decrease pressure in thorax/lung (1)	Mp4+mp5 require idea of *change* in volume /pressure	**4 exp**

Question Number	Answer	Mark
(c)	A 2.5×10^{-4} *B is incorrect because 2.5×10^{4} is 25 000* *C is incorrect because 25×10^{-4} is 0.0025* *D is incorrect because 25×10^{4} is 250 000*	**1 comp**

Question Number	Answer	Additional guidance	Mark
(d)	An explanation that makes reference to the following points: • higher surface area has greater respiration rate (1) • higher oxygen diffusion / more oxygen diffuses/ eq (1)	Accept reverse argument for lower s.a.	**2 exp**
			Total 8 marks

Q4.

Question Number	Answer	additional guidance	Mark
(b)	An explanation that makes reference to three of the following points: • dead / weakened / harmless / attenuated pathogen / eq (1) • produce memory cells / lymphocytes (1) • (secondary) immune response (1) • **faster / more** antibodies production (1)	allow weakened strain	**3 exp**

Q5.

4 of the following:

- Urea (1)
- Hormones (1)
- Digested food (1)
- Carbon dioxide (1)
- Heat energy (1)
- Also given a point: blood cells

Q6.

(a) Hemoglobin (1)

(b) In red blood cells (1)

(c) Protein (1)

(d) At the level of the lungs, it binds to oxygen that has diffused into the blood. (1) This binding is reversible. (1) That oxygen is taking throughout the body where it is unloaded from the hemoglobin molecules at the level of respiring tissues. (1)

Q7.

(a) Preventing excessing blood loss from damages vessels (1) and preventing the entry of microorganisms into the bloodstream (1).

(b) Fibrin is the protein. (1) It results in blood clot formation by forming a net/mesh (1) that traps platelets and other red blood cells (1).

Q8.

A stoma is formed by the opening between 2 guard cells (or any correct mention of guard cells) (1). When guard cells fill with water (0.5), they swell and change shape (0.5) and move away from each other resulting in the opening of the stoma (0.5). When they lose water (0.5), they become flaccid (0.5) and move closer together resulting in the closing of the stoma (0.5).