This is a Class 1 exam

Lebanon Evangelical School
for Boys and Girls
Loueizeh - Baabda

Stage Exam 06

19, 20, 21JUN2023

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

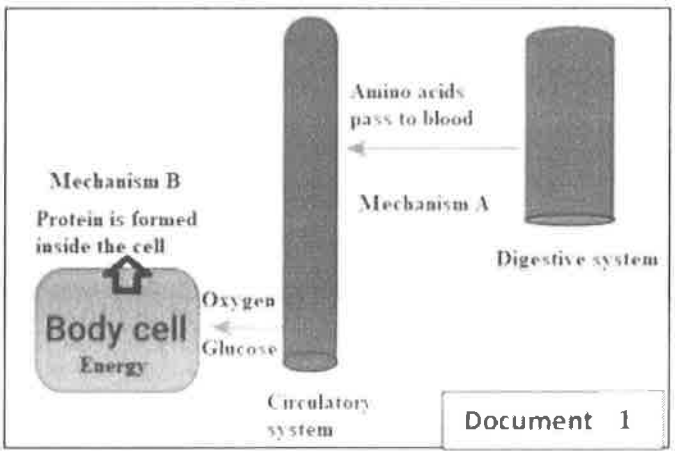
Subject :	Biology	
Class :	9B and 9C	
Teacher :	Christine Khalil	
Duration :	1 hour	
Your name :		*Time taken to complete exam*
Your Class :		
Exam Room :		
How many sheets, including cover sheet :		

- 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.

Exercise 1 (5.5 points)

Indicate the true statement (s) and correct the false one (s).

1. Hemoglobin is a protein found on the surface of white blood cells responsible for the transport of respiratory gases.
2. Diffusion is the passage of gases from a medium of low pressure to a medium with high pressure.
3. Hydrolysis allows a dry substance to become moist.
4. Cellular metabolism includes a set of chemical reactions of synthesis and degradation.
5. Mechanism A in document 1 represents diffusion.
6. Mechanism B in document 1 represents oxidation.



Document 1

Exercise 2 (7 points)

Grade 9 students were wondering if bile is responsible for the digestion of lipids.

For this reason, their teacher conducted with them the experiment described below:

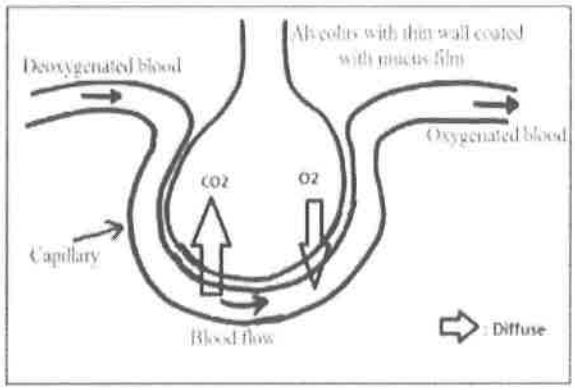
- They put the same quantity 5 g of lipids in two test tubes A and B.
- They added a small quantity of bile to each of the two tubes.
- They added a quantity of 1 ml lipase enzyme to tube B only.
- Then, they placed both tubes in a water bath at temperature of 37°C for 120 minutes.

The results showed the disappearance of lipids in tube B while in tube A lipids were emulsified.

1. Pose the studied problem. (1)
2. Formulate a hypothesis concerning the role of the bile in digestion. (1)
3. Represent in the same table, the experimental conditions and the results obtained. (2)
4. Explain the results obtained. Is the hypothesis validated? (2)
5. Name the products formed after the complete digestion of lipids. (1)

Exercise 3 (5 points)

Coronavirus disease (COVID-19) is an infectious disease caused by the SARS-CoV-2 virus. Covid-19 directly impacts the lungs and damages the alveoli (air sacs) which affects the process of gas exchange. Document 1 represents the normal gas exchange at the level of a normal alveolus.



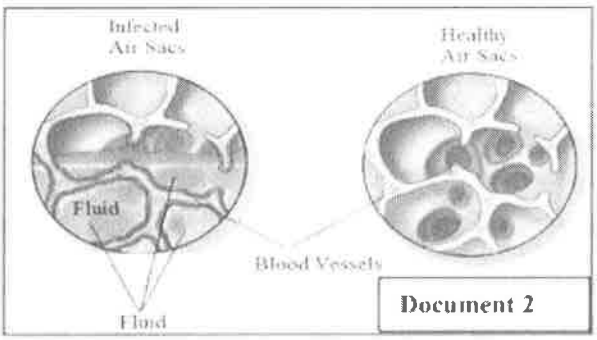
Document 1

1. Describe the direction followed by O_2 and CO_2 gases at the level of this alveolus. (1.5)

Document 2 shows the alveoli corresponding to a healthy individual and that corresponding to an infected individual.

2. Compare the aspect of the alveoli of these two individuals. (1.5)

3. Determine the effect of this disease on the process of gas exchange and consequently on the breathing process of an infected person. (2)



Document 2

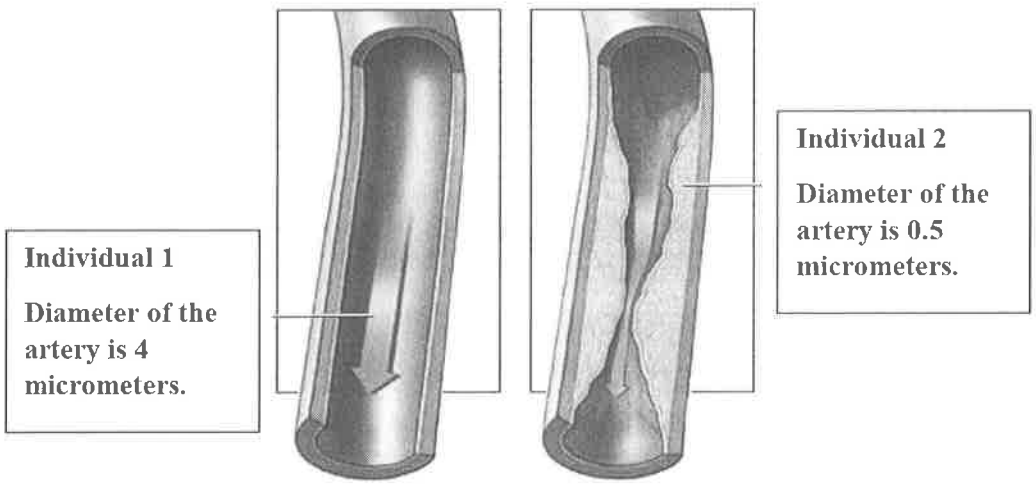
Exercise 4 (7.5 points)

Atherosclerosis is a cardio-vascular disease characterized by the formation of atheroma plaques at the level of coronary arteries. It results in the hardening and thickening of these arteries, loss of elasticity and the deposit of lipidic substances leading to the narrowing or even the full obstruction of the lumen. It is frequent in men above the age of 30 and in women above the age of 40. The main factors responsible for this disease are hypertension, diet rich in lipids, lack of activity and smoking.

1. Pick out from the text:
   a. The effect of atherosclerosis on coronary arteries. (0.5)
   b. The factors responsible for atherosclerosis. (0.5)
2. Explain how a diet rich in lipids can lead to a myocardial infarction. (1.5)

Mr. Fadi was hospitalized following a heart attack. The cardiologist performs a coronarography that reveals that 3 arteries are fully blocked.

Document 1 shows the aspect of a coronary artery in two individuals 1 and 2 (one of them is normal and the other suffers from a disease).



Document 1

3. Identify, based on document 1, the coronary artery that belongs to Mr. Fadi. (1)

The blood test results of Mr. Fadi are shown in document 2.

Substance	Normal Values (mg/dl)	Values of Mr. Fadi
Glucose	70-110	87
Total cholesterol	140-200	400
Triglyceride	55-150	140

Document 2

4. Compare the results obtained in document 2. (2)
5. Pick out the substance responsible for the obstruction of the coronary arteries of Mr. Fadi. (1)
6. Suggest 2 advices to prevent atherosclerosis. (1)

Bareme for Mock 9BC

Exercise 1 (each false 0.25, justification 0.75, true 0.5)

1. False. Hemoglobin is a protein found inside red blood cells responsible for the transport of respiratory gases.
2. False. Diffusion is the passage of gases from a medium of high pressure to a medium of low pressure.
3. False. Hydrolysis is the digestion of macromolecules in presence of water.
4. True.
5. False. Mechanism A is intestinal absorption.
6. False. Mechanism B is assimilation.

Exercise 2 (7 points)

1. Is Bile responsible for digestion of lipids? (1)
2. Bile is responsible for emulsification of lipids not their digestion. (1)
3. Table showing the experimental conditions and the results of the experiment. (title:0.25, legend:0.25, table:1.5)

Condition / Tube	5g of lipid	Bile	1ml lipase	Temperature 37°C	120 minutes	Result
A	+	+	–	+	+	5g of lipids emulsified
B	+	+	+	+	+	5g of Lipids disappeared

(+) presence (-)absence

4. In tube B containing lipase and bile, lipids disappeared while in tube A containing bile without lipase, they were only emulsified indicating that digestion took place in tube B but in tube A digestion didn't take place. (1) This shows that the enzyme lipase is responsible for digestion of lipids not bile. Yes, the hypothesis is validated: Bile is responsible for emulsification of lipids not their digestion. (1)
5. Fatty acid and glycerol. (0.5 each)

Exercise 3 (5 points)

1. O_2 diffuses from alveolar air to the blood (0.75) while CO_2 diffuses from blood to alveolar air (0.75).
2. Both alveoli in a heathy individual and in an infected individual are surrounded by blood vessels. (0.5) The alveoli of the infected individual are filled with fluid (0.5) but those of a healthy individual are empty. (0.5)
3. According to document 2, the air sacs of the infected individual are filled with fluid which will prevent the diffusion of the gases O_2 and CO_2, (0.75) so the gas exchange will decrease or stop in these alveoli, (0.5) if many alveoli are infected the % of O_2 absorbed by the blood will be very low (0.5), hence the infected person will suffer from breathing difficulties.

Exercise 4 (7.5 points)

1. a. It results in the hardening and thickening of these arteries, loss of elasticity and the deposit of lipidic substances leading to the narrowing or even the full obstruction of the lumen. (0.5)
   b. The main factors responsible for this disease are hypertension, diet rich in lipids, lack of activity and smoking. (0.5)
2. A diet rich in lipids will lead to the deposit of cholesterol on the borders of coronary arteries. (0.5) These are called atheroma plaques that will narrow the lumen of the artery and eventually fully block it (0.5). An area of the myocardium will no longer receive nutrients and oxygen gas and will no longer be able to contract normally which will lead to myocardial infarction. (0.5)
3. Mr. Fadi is individual 2 (0.25) since the artery presents deposit of atheroma plaques that are extremely narrowing its lumen to 0.5 micrometers which is much less than individual 1 where the lumen is much wider at 4 micrometers and no atheroma plaque is shown. (0.75)
4. The glucose value of Mr. Fadi 87 mg/dl is within the normal range 70-110 mg/dl. (0.5)
   The total cholesterol value of Mr. Fadi 400 mg/dl is higher than the normal range 140-200 mg/dl. (0.75)
   The triglyceride value of Mr. Fadi 140 mg/dl is within the normal value range 55-150 mg/dl. (0.5)
5. Total cholesterol. (1)
6. Avoid eating food rich in lipids, exercise. (each 0.5)