Class : Grade 9	***Score : / 20***
Section : English	***Duration : 60 minutes***
Subject : Biology	***Date :***

Name: .....

The exam includes 4 obligatory exercises distributed on two pages.

First Exercise (5 points)

Digestion of Lipids

We study "in vitro" the action of lipase on oil (lipids) in the presence of bile. The following table shows the content of different tubes, the conditions of the experiment, as well as the volume of oil that remains after three hours.

Tube	Content	Temperature (in ^{0}C)	pH	Volume of oil (in cm^3) after 3 hours
A	$4cm^3$ oil + lipase + bile	0	9	4
B	$4cm^3$ oil + lipase + bile	22	9	3
C	$4cm^3$ oil + lipase + bile	37	9	0
D	$4cm^3$ oil + lipase + bile	60	9	4
E	$4cm^3$ oil + lipase + bile	37	2	4

1. Referring to the table, indicate in which tube was oil totally digested. Justify the answer.

2. Analyze the results of tubes A, B, and C. what can you deduce?

3. By comparing tubes C and E, explain why there is no digestion in E.

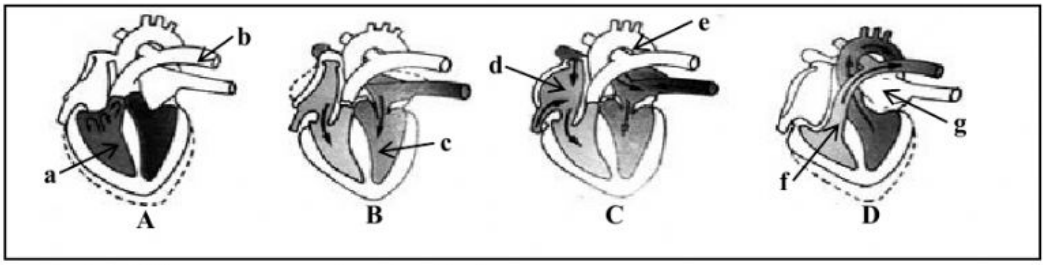
4. Name:
   4.1- The end products of the digestion of lipids.

   4.2- Two tests used to identify the presence of lipids and speak about one of them.

Second Exercise (5 points)

The Cardiac Cycle

The figures below illustrate the blood circulation in the heart during a cardiac cycle.



1. Label the structures ***a***, ***b***, ***c***, ***d***, ***e***, ***f*** and ***g***.

2. Determine the cardiac revolution corresponding to each figure.

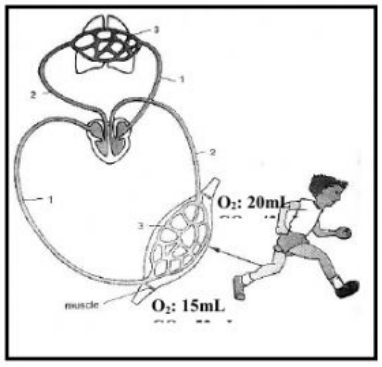
3. Classify these figures in chronological order.

4. State the role of structure ***f***.

Third Exercise (5 points)
Blood Circuit

The pulmonary circulation and the circulatory one constitute the blood circuit; the former is accomplished by the blood from the pulmonary artery to the pulmonary vein. However, the latter is ensured by the aorta and the two venae cavae.

The adjacent figure represents the blood circulation between the heart, the lungs and the leg muscle.



1. Specify the type of blood vessels designated by numbers 1, 2 and 3.

2. Give the function of the pulmonary circulation and that of the systemic one.

3. Identify the color of blood when it arrives to the muscle and when it leaves it.

4. Explain the variation of the quantities of CO_2 and O_2 gas in the blood as it leaves the muscle.

Fourth Exercise (5 points)

Assimilation and Transport of Gases

Assimilation is a synthesis reaction; the cell uses amino acids and energy to manufacture new molecules of proteins, for example hemoglobin, with their genetic programs. Hemoglobin is the protein of red blood cells which play a role in the transport of respiratory gases: oxygen and carbon dioxide.

The table below represents the partial pressures of oxygen and carbon dioxide in the alveolar air and in the blood.

	Oxygen pressure (mm Hg)	***Carbon dioxide pressure (mm Hg)***
Alveolar air	***105***	***40***
Blood	***40***	***45***

1. Pick up from the text the necessary elements for assimilation.

2. Compare the quantity of oxygen and that of carbon dioxide in the alveolar air and the blood.

3. Indicate the form in which oxygen is transported in blood.

4. Deduce the direction of exchange of oxygen and carbon dioxide at the level of the lungs.

5. Hemoglobin is a functional protein. Justify this statement.