وزارة التربية والتعليم العالي
المديريــة العامة للتربية
دائرة الامتحانات الرسميّة

امتحانات الشهادة الثانوية العامة
فرع الآداب والإنسانيات

دورة الـعام ٢٠١٩ العاديّة
الخميس ٢٠ حزيران ٢٠١٩
مكيفة

مسابقة في الثقافة العلميّة – مادة علوم الحياة

المدة: ساعة واحدة

(إنكليزي)

الاسم: ....

الرقم: ....

Exercise 1 (7points)   **Multiple Sclerosis, a Neurological Disease**

Multiple sclerosis is a neurological disease that begins with visual troubles, partial paralysis, clumsiness, or walking problems. This disease is due to a progressive destruction of the myelin sheath by white blood cells.

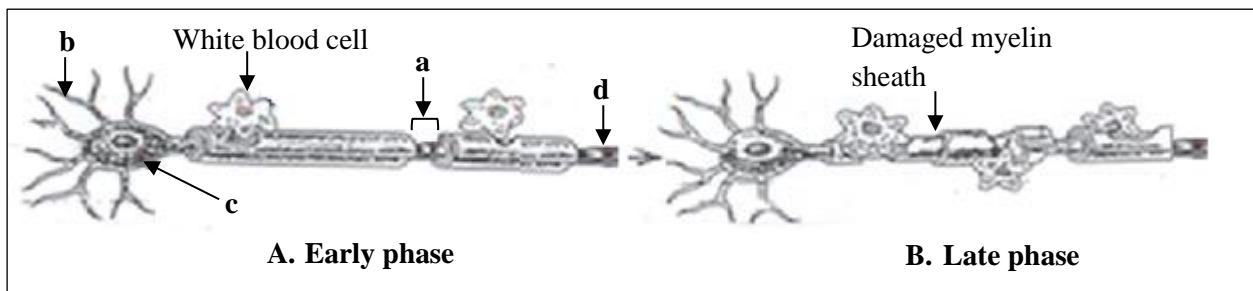**Document 1**

1- **Pick out** from <u>document 1</u>:

    1-1- the <u>4 symptoms</u> of multiple sclerosis.

    1-2- the <u>cause</u> of this disease.

<u>Document 2</u> shows the aspect of a myelinated neuron of an affected individual during **two successive phases of the disease**:

    − at the **early** phase (A) (beginning of the disease)
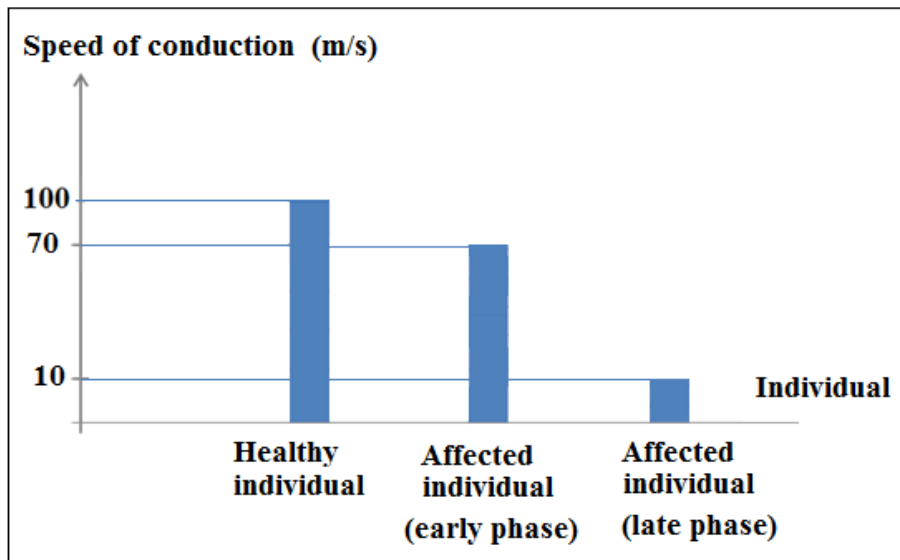
    − and at the **late** phase (B).

Document 2

2- **Match** each of the structures <u>a, b, c and d</u> of 'document 2' to the suitable number:

        1- Axon

        2- Node of Ranvier

        3- Cell body

        4- Dendrite

Document 3 represents the speed of conduction of the nervous message recorded at the level of a myelinated nerve fiber <u>in a healthy individual</u> and in <u>an affected individual</u> during the two phases early and late.

Document 3

3- **Recopy** and **complete** the table below based on the histogram in <u>document 3</u>.

	Healthy individual (Control)	Affected individual (Early phase)	Affected individual (Late phase)
Speed of conduction of nerve message (in m/s)			

Document 3

4-

    4-1- Analyze, based on <u>document 3</u>, the variation in the speed of conduction of nervous message <u>for each individual</u> (healthy and affected).

    4-2- What can you **conclude** concerning the effect of the disease on the speed of conduction of nervous message?

5- **Name** <u>two</u> other neurological diseases.

Exercise 2 (6 points)   **Obesity**

Obesity, a state characterized by an abnormal or excessive accumulation of body fat, can lead to dangerous consequences on health.

Three individuals A, B and C consult a dietitian:

- They have **same age (30 years)**
- They have **same height (1.7m),**
- They have **different body masses**:
    - 70 kg for individual A
    - 90 Kg for individual B
    - 105 Kg for individual C

The body mass index (BMI) is used to measure the degree of obesity (document 1).

BMI 20		25	30	
	Normal	Overweight	Obese	
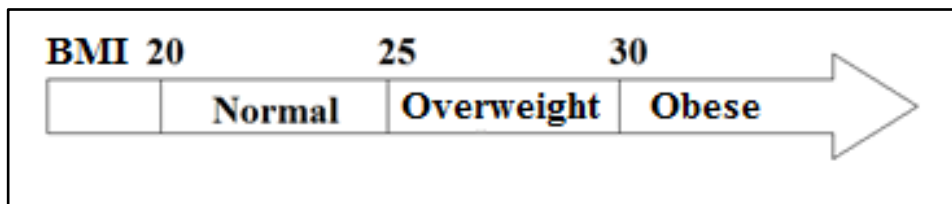
Document 1

1- **Calculate** the BMI of each individual (A, B and C) using the following formula:

$$BMI = \frac{mass\ (kg)}{(Height\ m)^2}$$

2- **Identify** the category to which each individual belongs by referring to document 1.

Document 2 reveals the life style and the food ration of each of the individuals A, B, and C.

		Individual **A**	Individual **B**	Individual **C**
Life style		Moderate activity	Sedentary (no activity)	Moderate activity
Food ration (g)	Carbohydrates	117		117
	Proteins	27		27
	Lipids	31.5		64

Document 2

3-

    3.1- **Compare** <u>the life styles</u> of these three individuals (A, B and C).

    3.2- **Compare** <u>the food ration</u> of these three individuals (A, B and C).

4- Draw out <u>the causes</u> of the excess of the body mass in the concerned individuals.

5- Name <u>two diseases</u> that obese people might suffer from.

Exercise 3 (7 points)   **Origin of Coronary Diseases**

Coronary diseases are a major cause of deaths encountered mostly in the developed countries. Document 1 represents the relation between the frequency of these diseases and the blood cholesterol level.
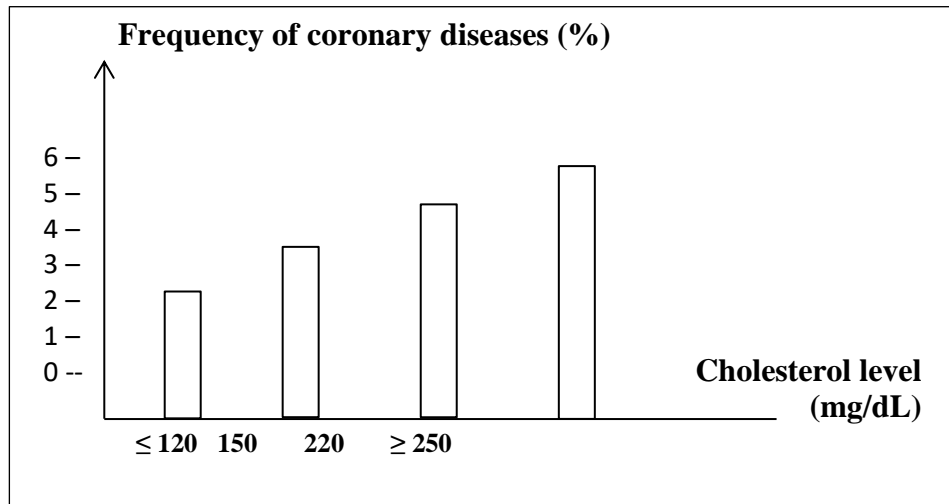
Document 1

1- Draw a table presenting the results obtained in document 1.

2-1- Analyze the variation in the frequency of coronary diseases as a function of cholesterol level.

2-2- What can you **conclude** concerning one of the risk factors of coronary diseases?

A man is hospitalized as a result of a heart attack. The medical analyses of this man show **three narrowed coronary arteries** which are almost **blocked**.

3- Name the disease that causes the narrowing of these arteries in this man.

Document 2 shows the blood levels of certain substances in this man and the corresponding normal levels.

	Blood levels in the patient (mg/dL)	Normal blood levels (mg/dL)
LDL	180	108-155
HDL	30	40-80

Document 2

4-

4.1- **Indicate** the role of LDL.

4.2 - **Indicate** the role of HDL.

5- Compare the value of LDL and HDL of the patient to the values in a normal individual.

6- What additional information does document 2 provide concerning the **origin of the disease** in this man with respect to the values of LDL and HDL?