مسابقة في الثقافة العلميّة – مادة علوم الحياة
المدة: ساعة واحدة

الاسم:
الرقم:

Answer the following exercises.

Exercise 1 (5 points) Drugs

Indicate the true statements and correct the false ones:

1. Drugs modify the transmission of the nervous message.
2. The repetitive consumption of a drug leads to a state of tolerance.
3. The neurotransmitter liberated in the synaptic cleft fixes on specific receptors in the presynaptic neuron.
4. The resting potential of a nerve fiber is approximately -70mV.
5. Substance P is the neurotransmitter of pleasure.

Exercise 2 (7.5 points) The Kwashiorkor

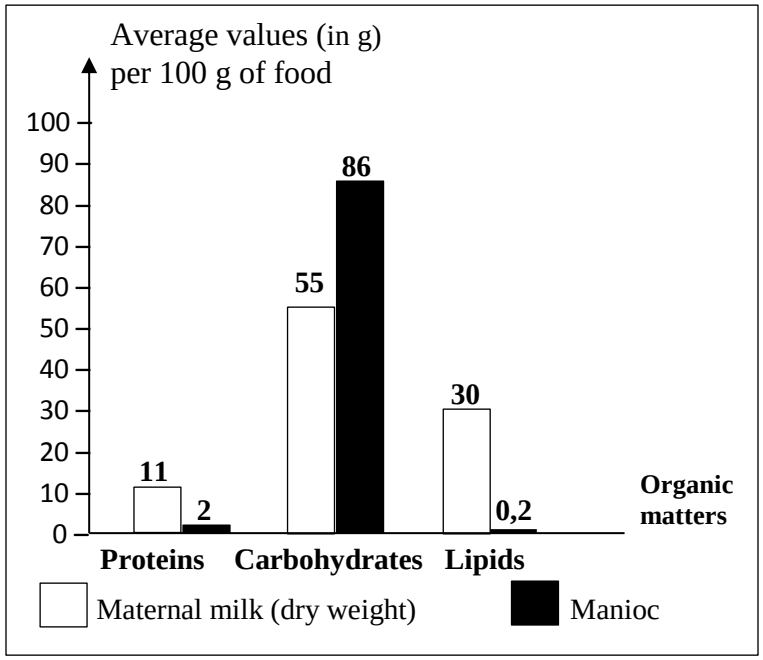
Kwashiorkor is a disease due to malnutrition which is characterized by edemas, dermatoses and gastro-intestinal disorders. It affects mainly young children between six months to three years of ages who are brutally weaned from maternal milk following the birth of a second child in their family. These young children are placed on another diet based on manioc, poor in certain matter of animal origin.

Document 1

1. Pick out, from the text, the symptoms of Kwashiorkor.
2. What does malnutrition signify?

Document 2 represents the composition in organic matter of maternal milk and manioc.

3. Draw a table that shows the average values of proteins, carbohydrates and lipids in 100 g of maternal milk and manioc (doc.2).
4. Indicate from document 2, the food which is the richest in each of the components: proteins, carbohydrates and lipids. Justify the answer.
5. Draw out the probable cause of kwashiorkor.
6. Name another nutritional disease due to malnutrition.



Document 2

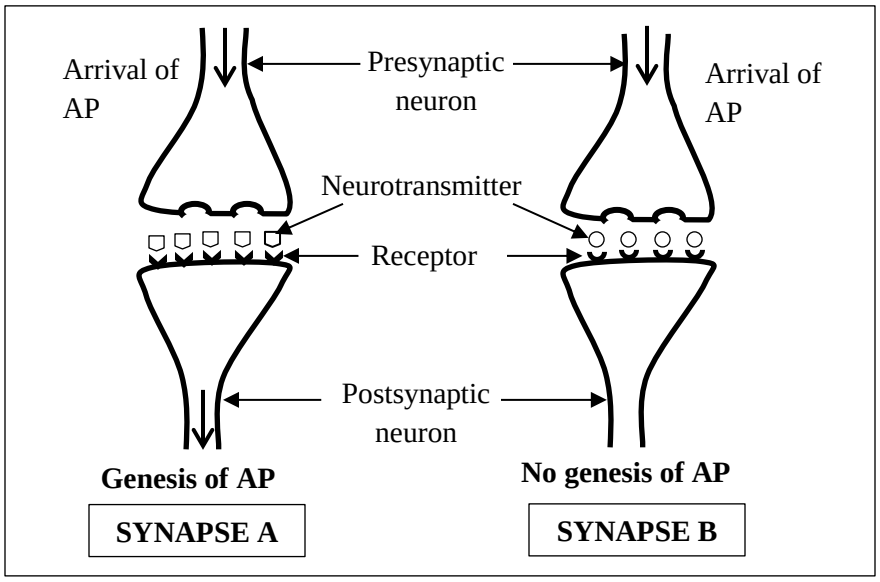
Exercise 3 (7.5 points) **Synaptic Transmission**

The neuron is a nerve cell composed of a cell body and multiple prolongations: the dendrites that are short and finely branched and the axon which is the longest and the largest part which ends up by the terminal buds**.** The communication between neurons is ensured by functional junctions, the synapses. The latter permit the filtration and the integration of the received nervous information.

Document 1

1. Pick out from the text:
   - **1.1.** the constituents of a neuron.
   - **1.2.** the role of the synapse.

Document 2 reveals two neuro-neuronic synapses (A and B). One of these synapses is excitatory and the other is inhibitory.



Document 2

2. Identify the nature of each of these two synapses.
3. List the steps of the transmission of the nervous message at the level of the synapse.

The postsynaptic neuron of synapse A is stimulated with effective intensity.
No AP is generated at the presynaptic neuron.

4. Draw out a characteristic of the transmission of the nervous message at the level of a synapse.

مسابقة في الثقافة العلميّة – مادة علوم الحياة

اسس التصحيح

Exercise 1 (5 points) **Drugs**

Q.	Answer key	Grade
1	True	**1**
2	True	**1**
3	The neurotransmitter liberated in the synaptic cleft fixes on specific receptors in the postsynaptic neuron.	**1**
4	True	**1**
5	Substance P is neurotransmitter of pain. Or dopamine is neurotransmitter of pleasure	**1**

Exercise 2 (7.5 points) **The Kwashiorkor**

<table>
<tr><th>Q.</th><th>Answer key</th><th>Grade</th></tr>
<tr><td>1</td><td>The symptoms of Kwashiorkor are edemas, dermatoses and gastro-intestinal disorders</td><td>1</td></tr>
<tr><td>2</td><td>Malnutrition is a consequence of food ration quantitatively and/or qualitatively unbalanced.</td><td>1</td></tr>
<tr><td>3</td><td>
<table>
<tr><th>Average values of organic matters (in g) per 100 g of food
Food</th><th>Proteins</th><th>carbohydrates</th><th>Lipids</th></tr>
<tr><td>Maternal milk (dry weight)</td><td>11</td><td>55</td><td>30</td></tr>
<tr><td>Manioc</td><td>2</td><td>86</td><td>0.2</td></tr>
</table>
The composition in organic matters of maternal milk and manioc
</td><td>2</td></tr>
<tr><td>4</td><td>The food which is the richest in proteins is maternal milk because it contains 11 g per 100 g of protein, a value greater than 1 g per 100 g for manioc
The food which is the richest in carbohydrates food manioc because it contains 86 g per 100 g of proteins, which is higher than that of maternal milk (55 g per 100 g).
The food which is the richest in lipids is maternal milk because it contains 30 g per 100 g of lipids, which is higher than that of manioc (1 g per 100 g).</td><td>1.5</td></tr>
<tr><td>5</td><td>The probable cause of kwashiorkor could be:
– An excess of carbohydrates
– a deficiency in protein and/or in lipids
– a deficiency in lipids</td><td>1</td></tr>
<tr><td>6</td><td>Marasmus</td><td>1</td></tr>
</table>

Exercise 3 (7.5 points) **Synaptic Transmission**

Q.	Answer key	Grade
1.1	The neuron is a nerve cell composed of a cell body and multiple prolongations: the dendrites and the axon and the terminal buds**.**	**1**
1.2	The synapse allows the communication between neurons	**1**
2	Synapse A is excitatory (1/2) because it permits the genesis of an A P. at the level of the post-synaptic neuron (1/2). Synapse B is inhibitory (1/2) because it does not permit the genesis of an A P. at the level of the post-synaptic neuron (1/2).	**2**
3	The steps of the synaptic transmission: 1. Arrival of nerve message to the presynaptic terminal bud of the presynaptic neuron. 2. Liberation of the molecules of neurotransmitters by exocytosis into the synaptic cleft. 3. Fixation of neurotransmitters to the specific receptor on the membrane of the post-synaptic neuron. 4. Generation of a post-synaptic potential or transmission of nerve message at the level of postsynaptic neuron 5. Elimination of the neurotransmitters by enzymatic degradation or by recapture of neurotransmitters.by the presynaptic neuron.	**2.5**
4	At the level of the synapse, the transmission of the nervous message is unidirectional: it permits the transmission of nerve impulse from the presynaptic neuron to the postsynaptic neuron.	**1**