

***“Lomonosov” Academic Competitions
for high schoolers***

2010 -2011

***Tests for a Preliminary Round
On
Psychology
(11th form)***

11th form

Dear competitors!

We hope you will succeed in accomplishing all the assignments suggested below. Take your time, read attentively the formulation and requirements for the tasks. Write down the answers legibly; don't forget to indicate the number of each task. We wish you good luck!

You have to choose only one answer among the suggested options; for tasks 1-4 write down 'agree' beside the answer you choose.

Task 1.

Peptide bond between amino acids in a molecule of protein is underlaid by:

- a) the principle of complementarity;
- b) insolubility of amino acids in water;
- c) solubility of amino acids in water;
- d) the presence of carboxy and amino group;

Task 2.

Anabolism in animal cells is not possible without energy exchange, since the latter provides the cell with:

- a) enzymes;
- b) molecules of protein;
- c) molecules of adenosine triphosphoric acid;
- d) oxygen;

Task 3.

Grown up people, suffering a surplus hormone production in the thyroid body, which regulates processes of metabolism, may develop:

- a) cretinoid idiocy;
- b) Graves' disease;
- c) diabetes mellitus;
- d) myxedema;

Task 4.

Human behaviour reveals some examples of inadequately exaggerated reaction on certain problems, suggested by physiological processes in the organism (the idea is best expressed by the following proverbs: “the tongue ever turns to the aching tooth”, “a hungry belly has no ears”, “a hungry man would smell meat afar off”.) The basic foundation for such processes is:

- a) the phenomenon of external inhibition;
- b) orientation reflex;
- c) formation of the dominant;
- d) chiasm of nerve tracts;

Task 5.

If you agree with the suggested judgment, put down a “YES” beside it, if you disagree with it, put down a “NO”.

- a) In smooth muscle cells fibres of contractile protein are fixed on the inside of the cell membrane. _____
- b) Certain hormones may assume the function of ferments in human organism. _____
- c) Direction of gene mutations is determined by the character of external agency. _____
- d) Phenotype is a complex of external characteristics of an organism. _____
- e) Meiosis is the process of the formation of two cells on the bases of one. _____

Task 6.

Give an expanded answer to the question.

Capillary walls of most of our organs are impenetrable for blood corpuscles. There are, however, capillaries, which can ‘let through’ blood corpuscles. What are the organs in question? What peculiarities of capillary structure are connected with the function of these organs?

Task 7.

Alexander invited Peter to visit him. Giving directions, he said that his flat № 333 was in the 10th riser blocks of flats. But he forgot to give the number of the floor. Having approached the house, Peter discovered that it was a nine-storeyed building. Which floor does he need to ascend? (Each floor has an equal number of flats, the numeration in the house starts, as usual, with 1.)

Task 8.

There are ten cards, each with one side white and one side black. They are laid on the table with the white side upward. Constantine reversed 5 cards, then Serge turned over 6 cards. Olga proceeded turning upside down 7 cards. As a result, all ten cards were now laid with the black side upward. How was it accomplished? (cards can be reversed more than once).

Task 9.

How many zeroes close the multiplication product of all natural integers from 1 to 2010 inclusively?

Task 10.

The commission comprising three people keeps the papers in a safe. How many locks do they need and how should they distribute the keys among the members so that any two members, that come together, could open the safe, but no one could do it alone?

Task 11.

Franklin Delano Roosevelt, the USA president, giving his description of public progress, would emphasize: “The test of our progress is not whether we add to abundance of those who have much, but whether we provide enough to those who have little.”

What is your understanding of the word “progress”? What criterion for progress was suggested by Roosevelt? What other criteria do you know?

Task 12.

Read the statement and decide which of the notions suggested below meets its meaning. Support your choice with reasoning.

The statement: “When is a pleasure, the life is great! When is a duty, life is but slavery.”(M. Gorkiy)

Notions: education, labour, politics, freedom.

Task 13.

Match up one of the indicated conceptions with a suggested succession of words, forming the latter into a definition of the concept in question. Do this for both word successions.

You should not use the words twice, but you can add prepositions and change the case form of a word (we put them in the Nominative case).

Word succession 1: Social, process, cultural, worldwide, integration, economic.

Word succession 2: Special, form, regulation, human, neo-biological, relation, cultural standard.

Conceptions: globalization, morality, conscience.

Task 14.

A.S. Pushkin wrote about M.V.Lomonosov: “Displaying the combination of a remarkable will power and a remarkable ability for penetration, Lomonosov embraced all the branches of enlightenment. Scientific appetite was insatiable passion of his heart, full of desires.” (*A.S.Pushkin* On the Preface of monsieur Lemontey for the collection of fables by N.A. Krylov)

What personality features were marked by Pushkin as those determining Lomonosov’s creative development? Introduce examples of Lomonosov’s achievements in different spheres of art and science, which should reveal peculiar characteristics of his personality.