<table>
<tr><th>№</th><th>ITEMS</th><th colspan="2">Score</th></tr>
<tr><td colspan="4">Diversity in the living world and evolutionary characteristics of the living world</td></tr>
<tr><td>1.</td><td>On Earth, there are a huge number of species of living organisms. Over the course of evolution, all species have developed unique traits. Currently, scientists use these differences to classify organisms into groups using various systematic units.
Analyze the images below.
a) Fill in the blank spaces in the table with the names of the taxons to which the species represented in the image belong.
<table>
<tr><td>Species</td><td> 
Dandelion
(Taraxacum officinale)</td><td> 
Orchard snail
(Helix pomatia)</td><td> 
Honey bee
(Apis mellifera)</td><td> 
Dove
(Columba livia)</td></tr>
<tr><td>Class</td><td></td><td>Gastropoda</td><td></td><td></td></tr>
<tr><td>Phylum</td><td></td><td></td><td></td><td>Chordates</td></tr>
</table>
</td><td>L

0
1
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6</td><td>L

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6</td></tr>
</table>

2. **a) Complete** the table below with the **differences** between plants and animals.

Plants	Criteria	Animals
1.……	**Specific cellular structure**	**1.……...**
1. *Directed movement (tropism)* **2.……**	**Responses to environmental factors**	**1.**…… *Reflex*……..

b) Column A indicates **phylums of plants** while **column B** – **their characteristics**. **Write** in the provided space **A** the corresponding numbers from column **B**. *One number is extra!*

Column A		Column B
Bryophytes	_____	**1.** The seeds develop on the scales of the female cones;
Ferns	_____	**2.** Absorb water with the entire surface of the body;
Angiosperms	_____	**3.** Sori form on the inferior part of the leaves;
		4. The fruit develops from the ovary.

L L
0 0
1 1
2 2
3 3
4 4
5 5
6 6

3. **I. Analyze the image. Name** the main adaptations of birds to the flight:

1. Skeleton-_____;

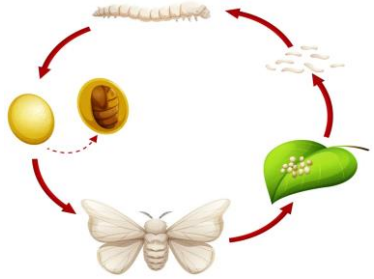
2. Body shape-_____;

3. Excretory system-_____;

4. Reproductive system-_____.

L L
0 0
1 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8

II. The silkworm butterfly (*Bombyx mori*) has a great economic importance. Sericulture involves growing of silkworm to produce natural silk. **Analyze** the image.



a) Name the type of metamorphosis found in silkworms.

_____

b) Circle on the image the stage of the development in which the natural silk will be extracted.

c) Present an argument which you would use to motivate the young people of the Republic of Moldova to develop a business based on the growth of silkworm.

_____
_____
_____
_____

4. The images below represent *analogous organs* and *homologous organs.*

a) Complete the table with the name of the organ types corresponding to the images.

Organs	
……	……
Whale Frog Horse Lion Human Bird 	 ***Insect*** ***Bird*** ***Bat***

b) <u>Underline</u>, in the row below, *the branch of biology* that offers as arguments the evidence of evolution presented in the table above.

Comparative Anatomy ***Embryology*** ***Paleontology*** ***Molecular Biology***

c) Name two idioadaptations of birds referring to the type of nutrition.

1._____

2._____

L 0 1 2 3 4 5 L 0 1 2 3 4 5

Vital systems and processes

5. **a) Write** in the provided space below the definitions for the following biological terms:

Cell - _____

_____

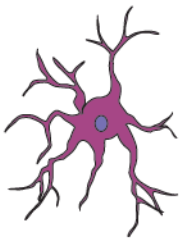
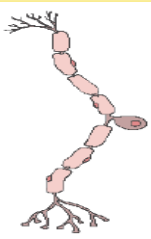
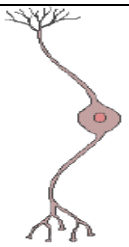
Hormone- _____

_____

L 0 1 2 3 4 L 0 1 2 3 4

6. On the basis of the morphological structure and the function performed, neurons are classified into several types. **Analyze** the images.

a) Complete the table with the names of the types of neurons.

			
Anaxonic	……	……	……

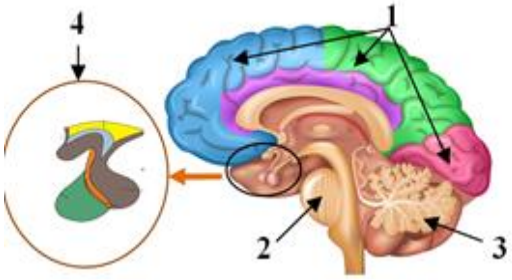
b) Fill in the schema with the type of neurons according to the function they perform.

Types of neurons

- **1**…… -
  receive excitations from the stimuli of the external environment.
- **2**…… -
  transmit the nerve impulse through the axons to the effector organs.
- **3**…… -
  take in the information, analyze it and develop a response.
- **4**…… -
  hypothalamic neurons secreting neurohormones.

L 0 1 2 3 4 5 6 7 L 0 1 2 3 4 5 6 7

7. **a) Write down** the names of the structures that correspond to the numbers in the image.



1._____
2._____
3._____
4._____

b) Complete the table.

Analyzers	Receptors	Localization of the receptors
Visual	1.	
Auditory	1. *Organ of Corti*	
……	1.	*Olfactory mucosa*
Gustatory	1.	
Tactile	1. *Krause Corpuscles*	

L 0 1 2 3 4 5 6 7 8 9 10 11 12
L 0 1 2 3 4 5 6 7 8 9 10 11 12

8. The pituitary gland is called the endocrine brain because most of the hormones secreted by the pituitary gland regulate the activity of other glands.

a) Complete the table with the names of the pituitary hormones and the names of the target organs.

	Hormones	Target organs
The pituitary *(the endocrine brain)*		*Thyroid*
	Adrenocorticotropin	
		Gonads
	Oxytocin	
		Mammary gland

b) Name the hormone secreted by the cortical layer of the adrenal glands responsible for the metabolism of water and mineral salts. _____

L 0 1 2 3 4 5 6
L 0 1 2 3 4 5 6

9. **I.** The urinary system has the major function of eliminating liquid waste.
Complete the schema.

1.....
the structural and functional unit of the kidney

a).....
structure formed by the Bowman's capsule, in which the Malpighian glomerulus is found

b) Renal tubule
.....
.....

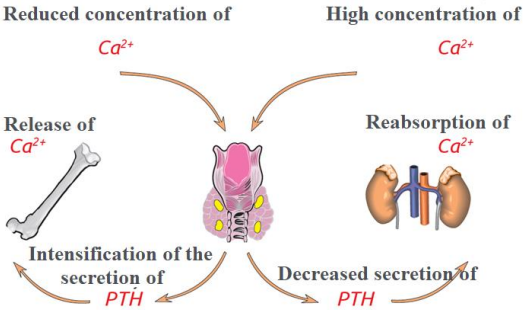
L 0 1 2 3 4 5 6 7 8 9 10
L 0 1 2 3 4 5 6 7 8 9 10

II. Name the organs with excretory functions that eliminate the following metabolic wastes:

a) *Heavy metals-* _____;

b) *CO_2 and H_2O (in the form of vapors)-*_____.

III. *Analyze* the image.



a) Describe the role of the parathyroid glands in the calcium metabolism, based on the adjacent image.

_____
_____
_____
_____
_____
_____

b) The accumulation of calcium in the blood can lead to renal calculus disease.
Write down a symptom of this disease.

_____

c) Name two other causes that can lead to renal calculus disease.

1._____

2._____

10. The thyroid is an endocrine gland with multiple functions in the human body. The Republic of Moldova faces a high frequency of dysfunctions of this gland. Below are the biochemical analyses of two patients. **Analyze** the data in the table.

Thyroid hormones	Laboratory result		Reference values
	Patient 1	***Patient 2***	
T_3	230 ng/dL	65 ng/dL	80-220 ng/dL
T_4	14 mcg/dL	3,5 mcg/dL	5,0-13 mcg/dL

a) Circle in the table, the number of the patient (**1** or **2**) whose analyses indicate the presence of ***hypothyroidism.***

b) Name the chemical element that accumulates in the thyroid gland and is necessary for the synthesis of thyroid hormones._____

c) Name the disease caused by the hypersecretion of thyroid hormones, whose symptoms are: weight loss, emotional instability, increased sweating, protrusion of the eyeballs.

_____

d) Suggest two methods of prophylaxis of thyroid gland diseases.

1._____

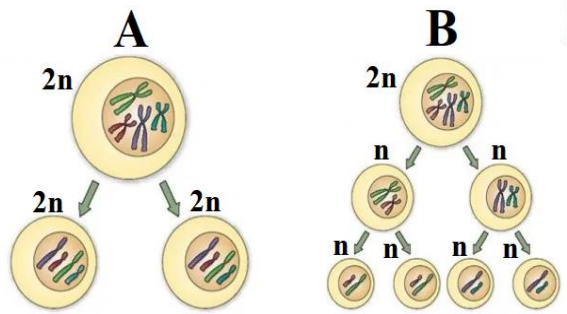
_____

2._____

_____

L 0 1 2 3 4 5

L 0 1 2 3 4 5

Basis of genetics and organism improvement/genetic engineering			
11.	**Write** in the provided space the definition for the following biological term: ***Gene*** **-**_____ _____ ***Mitosis*** **-**_____ _____	L 0 1 2 3 4	L 0 1 2 3 4
12.	The image illustrated the types of cell division. ***Analyze the image.*** **I. <u>Underline</u>** the correct answer in the given statements.  **a)** The diagram represents ***direct;*** ***indirect*** cell division. **b)** Keeping the set of chromosomes in the daughter cells takes place through the division represented by the letter: ***A ;*** ***B.*** **c)** In the process of *oogenesis*, the *primary oocyte* has: ***46 chromosomes;*** ***23 chromosomes.*** **d)** The formation of spermatozoa occurs through: ***mitotic;*** ***meiotic*** division. **II. a) Circle** in the image above letter (**A** or **B**), which represents the type of division within which the *crossing-over* process takes place. **b) Describe** the biological role of meiosis. _____ _____ _____	L 0 1 2 3 4 5 6 7	L 0 1 2 3 4 5 6 7
13.	**Solve the problem:** A man without freckles, suffering from color-blindness, married a woman with freckles who perceives colors normally (*diheterozygous*). It is known that color-blindness and the lack of freckles are transmitted hereditarily as recessive traits. Color-blindness is linked to the X chromosome, while the presence of freckles is an autosomal trait. **Determine** the probability of birth in this family of color-blind children without freckles. _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____	L 0 1 2 3 4 5 6 7 8 9 10 11	L 0 1 2 3 4 5 6 7 8 9 10 11

Ecology and environmental protection			
14.	**I. Write** in the provided space the definition for the following biological term: ***Biotope*** **-**_____ _____ **II.** The biogeochemical cycle represents the circuit of chemical elements necessary for living organism, in the biotic (biosphere) and abiotic (lithosphere, atmosphere and hydrosphere) space. The existence of such cycles provides the ecosphere a considerable power of self-regulation. The picture illustrates the circuit of water in nature. ***Analyze the image.***	L 0 1 2 3 4 5 6 7 8 9	L 0 1 2 3 4 5 6 7 8 9

a) Name two physiological processes through which plants are involved in the water cycle.

1._____

_____

2._____

_____

b) Write the name of the group of prokaryotic organisms that will ensure the return of inorganic substances to the soil.

……

c) Describe the role of symbiotic bacteria in the agroecosystem.

_____
_____
_____
_____
_____
_____
_____
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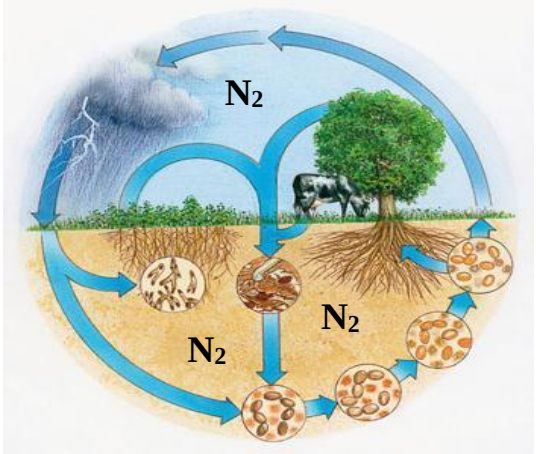
_____
_____



d) Recycling represents the introduction of residues or waste through a technological process with the purpose of their reuse. **Argue** the importance of waste recycling in protecting the environment.

_____
_____
_____
_____
_____