

CONCEPTION OF BILINGUAL EDUCATION IN BIOLOGY

Applying innovation methods (content analysis, method of association and modeling by mind mappings) in the education of Biology it is expected to increase the cognitive achievements of students on theoretical level.

In the application of that new didactic methods studying the biology syllabus in section (parts) “Nervous system” – (Spinal cord, Brain, Autonomic nervous system”) and in section “Endocrine system (“Hypophysis and adrenal glands”, “Other Endocrine glands”), the teacher builds (creates) easier the scientific model of the given syllabus. The last has always

created difficulties for the authors of textbooks, teachers and students.

Students with the help of the teacher create skills by building mind mappings to understand the great amount of complicated anatomic concepts (terms) as well as perceiving and interpreting the information.

Criteria for mastery of scientific model is the diagnostics of students achievements by applied standard tests. Their subtests cover IV, V and VI cognitive levels for knowledge and skills of B. Blum, as well as the contemporary state educational requirements.

DIAGNOSTIC TEST №2 NERVOUS SYSTEM

Instructions: You have 15 exercises with different grade of difficulty. The correct, complete and precise solving of an exercise is estimated with the appropriate points. Work carefully, reviewing the material. Exercises 6,8,11 require a single answer. All other exercises are with a multiple-choice answer. Analyze every possible answer in order to make the correct decision. Circle the correct answer.

Exercise №1. Find which of the following functions is only about nervous system?

- 1.Coordination of reflexes
- 2.Keep, compare and use of information
- 3.Protective reflexes
- 4.Movement of the body
- 5.Section of secretions

Variants: A – 3,4,5 B – 1,2
C – 1,3 D – 2,4

Exercise №2. Show variants, which are right about “grey matter of spinal cord”.

- 1.It is situated inside and envelopes as a mantle the white matter
- 2.It is built of the bodies of neurons
- 3.It contains ascendant motive fibres
- 4.It contains descending sensory fibres
- 5.It contains bodies and dendrites of motive, intermediate and vegetative neurons

Variants: A – 1,2 B – 5
C – 2,3 D – 4,5

Exercise №3. It is true that cutting of the posterior roots of the spinal nerves:

- 1.Leads to paralysis
- 2.Leads to lack of sensitivity
- 3.Interrupt the transmitting function of the spinal cord
- 4.Interrupt all these

Variants: A – 2 B – 3,5
C – 4 D – 2,5

Exercise №4. Figure out what of the following terms have the same meanings.

1. Posterior horns and posterior roots
2. Reticular formation and limbic system
3. Endocrine glands and glands with internal secretion
4. Sensory nerve and motor nerve
5. Nuclei of the central nervous system and nuclei of the cells

Variants: A – 1,3 B – 2
C – 3,4 D – 3,5

Exercise №5. A: Is there a connection between reflex and regulation of the processes.

Answer: 1) YES; 2) NO

B: Choose the answer as a proof:

1. The regulation is expressed by the process excitement
2. The regulation is expressed by the process

restraint

3. The regulation of the vital processes is generally fulfilled by the reflex arc

4. There is no connection between regulation and reflex

5. The reflexory activity does not depend on reflectors

Variants: A – 1,2,3 B – 2,3
C – 3 D – 4,5

Exercise №6. Give models of brainstem and cerebellum, choosing from these structures.

Write the right answers with ciphers in the table.

- | | |
|--------------------------|-----------------|
| 1. Medulla oblongata | 5. Hypothalamus |
| 2. Brain legs | 6. Midbrain |
| 3. Nuclei of vagus nerve | 7. Diencephalon |
| 4. Worms | 8. Pons |

Brainstem	Cerebellum

Exercise №7. Find out which of the following statements is very important for the growing of the brain.

- The growing of the axons
- The growing of the branches of the dendrites
- The covering of the axons with myelinated fibres
- Complicated dividing (mitosis) of the nervous

Variants: A – 1,4 B – 2,3,4
C – 1,2,3 D – 4

Exercise №8. Connect the terms in column A with the definitions in column B:

A. terms	B. definitions
1. reflex ...	a. it is situated in the base of the frontal lobe and receives impulses from the nasal mucosa
2. stimulation ...	b. thick ligament bundle of white matter, that connects the two hemispheres of the telencephalon with each other
3. meningi ...	c. simple stereotyped reaction/movement, secretion/, which is accomplished in response of sensory stimulus, where nervous system takes part in
4. olfactory system ...	d. contains nervous centres in the hypothalamus, thalamus, midbrain, in some zones of the cortex, which coordinate emotional expressions (joy, fear)
5. limbic system ...	e. protective layers of the brain and spinal cord
6. corpus callosum ...	f. transformation of the energy of the irritation in nervous impulses in the receptors

Exercise №9. The term “reticular formation”

combines:

- Neurons, located in the cortex
- Neurons, located in the medulla, midbrain and pons
- Neurons, located in the stem
- Neurons, located in every part of the telencephalon
- Compound system of interweaving rising and descending ways

Variants: A – 1,2 B – 2,4,5
C – 2,5 D – 4,5

Exercise №10. Some of the following terms respond to the zones of the telencephalon. Find them:

- | | |
|--------------------------|--------------------|
| 1. Motor | 6. Language |
| 2. Skin-muscular sensory | 7. Central fissure |
| 3. Executive | 8. Visual |
| 4. Olfactory | 9. Auditory |
| 5. Zone of the balance | 10. Taste |

Variants: A – 1,2,5,6,7 B – 3,4,5,7
C – 1,2,4,5,8,9,10 D – 4,5,8,9,10

Exercise №11. For the vegetative nervous system are true the statements:

- The vegetative nervous fibres lead a smaller speed from the somatic fibres
- It regulates functions which do not sag to conscious control
- the nervous way of the executive impulse is composed of two consecutively connected neurones
- the vegetative nervous knots are situated only in the side stems to the two sides of the spinal cord

Variants: A – 1,2 B – 2,3,4
C – 1,2,4 D – 1,2,3 E – 1,2,3,4

Exercise №12. Having in mind the structure of the nervous system, show the connection between column A and column B. Put the numbers from B in the dots in A.

A. Parts of the nervous system	B. Parts, functions
<p>A. Peripheral nervous system</p>	<p>1. Brain 2. Provide the movement of the voluntary skeletal muscles</p>
<p>B. Somatic nervous system</p>	<p>3. Spinal cord 4. Nervous 5. Ganglion 6. Sympathetic</p>
<p>C. Autonomic nervous system</p>	<p>7. Maintenance of the homeostasis 8. Provide the perception of the environment 9. Controls the internal organs 10. Cerebellum</p>
<p>D. Central nervous system</p>	<p>11. Vagus nerve 12. Sensory nerves 13. Reflex centres 14. Spinal nerves 15. Efferent nerves rhythm</p>

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Variants: A – 1,2 B – 2,3,4
C – 1,2,4 D – 1,2,3 E – 1,2,3,4

Exercise №13. Is there a connection between the vegetative nervous system (VNS) and the cardio-vascular system. Find an answer among the answers given:

1. VNS innervates the walls of the blood vessels
2. In the walls of the carotic arteries there are chimioreceptors whose irritant factor is CO₂
3. There is no direct connection
4. The vegetative neurons embrace the walls of the arteries
5. The nuclears of the VNS by their motor neurons regulate the blood circulation
6. The sympathetic branch intensifies the heart

7. The parasymphathetic branch slows down the heart rhythm

Variants: A – 1,2,5,6,7 B – 3,4,5,7
C – 1,2,4,5,6 D – 4,5,6,7

Exercise №14. Find out which of the following does not fill with cerebrospinal fluid.

1. Spinal cord canal
2. Brain ventricle
3. Intercellular spaces in tissues
4. The space between the cobweb-shaped and soft brain cover

Variants: A – 3 B – 1,3
C – 2,3 D – 1,2

Exercise №15. Build a model of the human nervous system.

DIAGNOSTIC TEST №4 ENDOCRINE SYSTEM

Instructions: You have 15 exercises with different grade of difficulty. The correct, complete and precise solving of an exercise is estimated with the appropriate points. Work carefully, reviewing the material. Exercises 2,3,10,12,13,14 require a multiple-choice answer. Analyze every possible answer in order to make the correct decision. Circle the correct answer. All other exercises require a single answer.

Exercise №1. Find the appropriate letter for the two empty spaces:

..... is often called the head gland of the internal secretory glands, but it is under the control of the

- A. Hypophysis, Hypothalamus
- B. Pancreas, Hypothalamus
- C. Thyroid, Parathyroid
- D. Hypothalamus, Hypophysis
- E. Hypophysis, Зрителен хълм

Exercise №2. Imagine that you are lost in the desert and you have nothing to drink. The level of the in your blood will rise. This will prevent the loss of water in your body.

- 1. Insulin
- 2. Adrenokortikotropen hormone
- 3. Oxitocin
- 4. Antidiuteric hormone
- 5. Salts

Variants: A – 1,2 B – 4
 C – 3 D – 1,4

Exercise №3. Build a model of the thyroid gland by choosing some of the following statements:

- 1. It is build of Langerhans isles
- 2. It controls the immune protection in the organism
- 3. It controls the activity of the parathyroid gland
- 4. It is build of vesicles
- 5. It is under the control of the front part of the hypothysis

Variants: A – 1,2 B – 2,4
 C – 4,5 D – 2,4,5

Exercise №4. After the hormones below write the glands which excretes those hormones.

- 1. Prolactin-
- 2. Adrenaline-
- 3. Insulin-
- 4. Noradrenalin-
- 5. Glucagon-
- 6. Antidiuretic hormone-
- 7. Testosterone-

Exercise №5. Connect with lines.

α -cells of the pancreas insulin
 β -cells of the pancreas glucagon

Exercise №6. Connect the hormones, marked with a figure with the most suitable concept, marked with a letter.

- 1. Hormone of growth A. Acromegally
- 2. Adrenal sexual hormone B. Parturition
- 3. Oxitocin C. Premature illusory puberty
- 4. Glucocorticoides D. Stress
- 5. Prolactine E. Frontal part of the hypophysis

Answers:

1 -	2 -	
3 -	4 -	5 -

Exercise №7. Connect the disease diabetes with the gland it belongs to:

- a) Thyroid gland
- b) Hypophysis
- c) Adrenal glands
- d) Parathyroid glands
- e) Pancreas
- f) Sexual glands

A. Which is the reason for this disease?

.....
.....

B. What are the symptoms and the consequences for the organism?

.....
.....
.....

Exercise №8. Prove the difference between the humoral and the nervous regulation.

.....

Exercise №9. Distribute in the table.

Glands with inner secretion	Glands with inner and outer secretion	Glands with outer secretion
1.	1.	1.
2.	2.	2.
3.		3.
4.		4.
5.		5.
		6.
		7.

Exercise №10. Mark the disease, caused by the violated function of the fore-part of the hypophysis.

- | | |
|----------------------|---------------------|
| 1. Basedow's disease | 4. Pituitary dwarfs |
| 2. Gigantism | 5. Acromegally |
| 3. Cretenism | 6. Myxodema |
| | 7. Endemic goitre |

Variants: A – 2,4,5 B – 1,2,4
C – 4,5,6 D – 3,4,5

Exercise №11. Hypophysis is called “gland of the glands”. Are there hormones, which work on formation and secretion of hormones in the hypophysis. Demonstrate with examples.

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Exercise №12. Where the anatomic functional connection between the two regulating systems (the nervous system and the endocrine system) is localized?

- The pons
- Epyphisal- retinal- hypothalamus track
- Hypothalamus-hypophysis
- Synaps
- Vegetative nervous system

Variants: A – 1,5 B – 2,3
C – 3,4 D – 3

Exercise №13. Patent medicine from what hormone is applied in pituitary dwarfs treatment?

- Insulin
- Antidiuretic hormone

- Adrenocorticotropen hormone
- Somatotropen hormone
- Tyroxin

Variants: A – 1,3 B – 2,4
C – 4 D – 3,5

Exercise №14. During hypofunction of the thyroid gland is observed:

- Lowering of exchange of substances
- Increase in the pulse
- Increased stimulation of the nervous system
- Backwardness in mind development

Variants: A – 1,4 B – 2,3
C – 1,2,3 D – 4 E – 1,2,3,4

Exercise №15. Build a model of the endocrine system.