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## ASSESSMENT TOOLS FOR MIDTERM ASSESSMENT

### “ADAPTIVE AND AGE-RELATED PHYSIOLOGY”

|                            |                           |
|----------------------------|---------------------------|
| <b>Curriculum</b>          | 31.05.01                  |
| <b>Specialty</b>           | General Medicine          |
| <b>Form of education</b>   | Full                      |
| <b>Designer Department</b> | Morphology and Physiology |
| <b>Graduate Department</b> | Internal Diseases         |

#### Term 6

#### CONTROL WORK - ABSTRACT

Writing an abstract involves a deep study of the designated problem.

**Abstract** (from Lat. refero-report, report) is a special essay that defines goals, objectives and conclusions that set out the main provisions of the topic or problem.

The subject of research papers is presented in the Funds of assessment tools and in teaching aids for independent work of the resident of the corresponding work program.

Abstracts are presented at the lesson according to the chosen topic and calendar-thematic plan, and are submitted to the teacher strictly within the specified time.

The summary of the selected information should be embedded in the text in accordance with a certain logic. The abstract consists of three parts: introduction, main part, conclusion.

a) in the introduction, it will be logical to justify the relevance of the topic (why this topic was chosen, how it is related to modernity and science);

goal (must correspond to the topic of the abstract);

tasks (ways to achieve a given goal) are displayed in the title of the work paragraphs.

b) the main part describes and analyzes the topic of the abstract as a whole, and then – a concise presentation of the selected information in accordance with the tasks set. At the end of the chapter, a conclusion (sub-conclusion) should be made, which begins with the words: "So...", "Eventually...", "At last...", "Finally...", "In conclusion...", "Summing up..." etc.

c) the conclusion contains outputs on chapters (1-1. 5 sheets). It is appropriate to express your point of view on the problem under consideration.

The abstract can be presented in the form of a presentation, and it is mandatory to meet the basic requirements for the abstract, including the correctness of the list of references!

Disclosure of the topic of the abstract assumes the presence of several specialized sources (at least 8-10 publications, monographs, reference books, textbooks) as a source of information. Preference is given to publications in specialized journals and monographs of recognized experts in the relevant field of knowledge. It is mandatory to use foreign literature.

#### List:

1. Human organism as a biological system.
2. Integral characteristic of physiological features of the organism at different stages of ontogenesis.
3. The organism as a unified whole
4. The concept of growth and development of a child's organism

5. Ontogenesis.
6. Perinatal period.
7. Postnatal period.
8. Age periodisation.
9. Laws of ontogenetic development.
10. The main theories of ontogenesis.
11. Influence of endo- and exogenous factors, and age-related anatomico-physiological features.
12. The role of heredity factors in the process of ontogenesis. The concept of gene pool.
13. The role of environmental factors in the process of ontogenesis.
14. Unevenness or heterochrony of development.
15. Approaches to justification of division of the life cycle of individual development into separate age periods.
16. The main stages of intrauterine development.
17. Physiological features of infants.
18. The main stages of childhood.
19. Growth and body proportions at different age stages of development.
20. Sensitive periods for various physical qualities.
21. Influence of heredity and environment on body development.
22. Criteria of biological age.
23. Definition of medians, retardants, accelerates.
24. Acceleration epochal and individual.
25. Causes of epochal acceleration.
26. Heterochronism and harmoniousness of development.
27. Critical periods in postnatal development
28. Principles of systemogenesis and advanced development of organs and functional systems in children and adolescents.

**TYPICAL QUESTIONS FOR THE CREDIT**  
**Tasks for the test contain theoretical questions**  
**and questions to assess practical skills.**

| Task for assessment indicators of the "Knows" descriptor   | Type of task       |
|--|--------------------|
| Formulate detailed answers to the following theoretical questions:<br>1. The human organism as a biological system.<br>2. Integral characteristic of physiological features of the organism at different stages of ontogenesis.<br>3. Phenotype and genotype.<br>4. Environmental factors affecting the organism in the process of its vital activity, growth and development.<br>5. Basic indicators of child development<br>6. The organism as a whole<br>7. The concept of growth and development of the child organism<br>8. Perinatal period.<br>9. Postnatal period.<br>10. Age periodisation.<br>11. Laws of ontogenetic development. | <b>Theoretical</b> |

12. Main theories of ontogenesis.
13. Influence of endo- and exogenous factors, and age-related anatomico-physiological features.
14. The role of heredity factors in the process of ontogenesis. The concept of gene pool.
15. The role of environmental factors in the process of ontogenesis.
16. Unevenness or heterochrony of development.
17. Approaches to justifying the division of the life cycle of individual development into separate age periods.
18. The main stages of intrauterine development.
19. Physiological features of infants.
20. The main stages of childhood.
21. Growth and body proportions at different age stages of development.
22. Sensitive periods for different physical qualities.
23. The influence of heredity and environment on body development.
24. Criteria of biological age.
25. Definition of medians, retardants, accelerates.
26. Acceleration epochal and individual.
27. Causes of epochal acceleration.
28. Heterochronicity and harmoniousness of development.
29. Critical periods in postnatal development
30. Principles of systemogenesis and advanced development of organs and functional systems in children and adolescents.
31. Characteristics of age periods of development.
32. Correlation of growth and development processes.
33. Definition of the concepts: continuity, heterochrony, systemogenesis, biological reliability.
34. Neurohumoral regulation of body functions.
35. Homeostasis and factors determining it.
36. Calendar and biological age, their correlation, criteria for determining biological age at different stages of ontogenesis.
37. Morphological criteria of biological age at different stages of ontogenesis.
38. The role of environment and heredity.
39. Age-related changes in neuron and nerve fibre structure.
40. Myelination of nerve fibres
41. Growth and shape of the brain
42. Ontogenesis of the large hemispheres.
43. Development of the conductive pathways.
44. Structural transformations of the cerebral cortex
45. Significance and structural and functional organisation and development of the nervous system.
46. Anatomico-physiological features and development of the central nervous system.
47. Influence of hormones on the development of the central nervous system.
48. Effect of hypoxia on brain development.
49. Maturation of electrical activity of the brain.

50. Features of maturation of the autonomic nervous system.
51. Evaluation of indicators and determination of the level of physical and neuropsychic development of a healthy child in different periods of childhood.
52. Features of child development during the first year of life.
53. Features of physical education and hardening of children in preschool institutions. Assessment of the child's readiness to study at school.
54. Processes of acceleration.
55. Features of the pubertal period.
56. Gerontology.
57. Biorhythms.
58. Concepts of geriatrics and gerontology.
59. Aging of the organism.
60. Theories of aging.
61. Longevity
62. Old age
63. Biological age
64. Constitution.
65. Body build.
66. Basic metabolism.
67. Energy expenditure in various activities.
68. Daily food ration.
69. Circadian rhythms.
70. Mental performance.
71. Physical performance.
72. General laws of growth and development of children and adolescents
73. The concept of ontogenesis.
74. The problem of age periodisation and its criteria.
75. Heterochrony and harmony.
76. Stage in the development of the organism of children and adolescents.
77. Critical periods in the postnatal development of children and adolescents.
78. The main age features of the musculoskeletal apparatus.
79. Age specific features of the cardiovascular system.
80. Age peculiarities of the respiratory system.
81. Age peculiarities of the endocrine system.
82. Development of secondary sexual characteristics.
83. Characteristics of secondary sexual characteristics in girls at different stages of ontogenesis.
84. Characteristics of secondary sexual characteristics in girls at different stages of ontogenesis.
85. Physiological features of an adolescent.
86. Changes in body proportions during ontogenesis.
87. Characteristics of the adolescent age period.
88. Maturity - as a period of ontogenesis, characterisation.
89. Factors affecting the functional state of the organism in old age.
90. Uneven rate of growth and development.
91. Biological reliability
92. Continuity and irregularity of growth and development.

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|--|----------------------------|
| <p>93. The state of the cardiovascular system in the intrauterine period.</p> <p>94. The state of the respiratory system in the intrauterine period.</p> <p>95. Fork gland (thymus) in ontogenesis.</p> <p>96. Hypothalamic-pituitary system. Age peculiarities.</p> <p>97. State of thyroid gland in ontogenesis.</p> <p>98. Stages of puberty.</p> <p>99. Dental age.</p> <p>100. Changes in respiratory volumes and capacities during ontogenesis.</p>  |                            |
| <p><b>Task for the assessment indicator of the "Able to" descriptor</b></p>  | <p><b>Type of task</b></p> |
| <p><b>Practical work</b></p> <p>Determination of individual health level</p> <p>Determination of biological age</p> <p>Ontogenesis and anatomo-physiological features of the most important parts of the CNS</p> <p>Muscle physiology</p> <p>Age features of ECG</p> <p>Indicators of heart rate variability</p> <p>Age patterns of development of digestion and metabolism in children.</p> <p>Solution of situational tasks:</p> <p>Task #1. Two students of the same age and physique after a race at 5000 m registered indicators of external respiration. The first student's respiratory rate (RR) was 40/min, respiratory volume (RV) was 500 ml. In the second student, HR was 27/min and DO was 1200ml. The dead space volume in both students was 150ml, the residual volume was 1000ml, and the expiratory reserve volume was 1500ml.</p> <p>Questions: 1. Why do external respiratory parameters change during running?</p> <p>2. What are the pulmonary ventilation coefficients of the students equal to? 3. Who has more efficient breathing?</p> <p>Task #2. As a result of destruction of lung tissue in a patient with tuberculosis, a permanent communication of bronchi with pleural cavity (spontaneous pneumothorax) was formed. How will this affect the respiratory excursions of the lungs? How will the contours of the affected lung change on the radiograph?</p> <p>Task No. 3. A patient who took a large dose of sleeping pills (barbiturates) was admitted to the clinic in a state of sharply depressed respiration. It is known that barbiturates reduce sensitivity of respiratory centre neurons to carbon dioxide gas. The doctor decided to administer pure oxygen breathing to the patient.</p> <p>Questions: 4. Explain whether the doctor made the correct decision in this case?</p> <p>2. What should be done to avoid undesirable consequences?</p> <p>Task #1. Among the clinical problems that arise in newborns, especially distinguished respiratory distress syndrome of prematurity, associated with a lack of surfactant production, covering the inner surface of the pulmonary alveoli.</p> <p>Questions: 1. What is surfactant?</p> <p>2. What is its main role in respiratory physiology?</p> <p>Task #5. Respiratory movements exist in the fetus.</p> <p>Questions: 1. At what term of intrauterine life do they appear and what is their</p> | <p><b>Practical</b></p>    |

frequency?

2. Why amniotic fluid does not enter the respiratory tract of the fetus?

Task #6. At the first breath the volume of exhaled air is 2-3 times less than the volume inhaled. Explain why?

Task number 7. It is known that in the intrauterine period, the respiratory tract of the foetus is filled with fluid, which is secreted by active transport. The fluid that fills the alveoli of the foetus is removed within 2-4 hours after birth. By which pathways?

Test:

1 The period of second childhood in boys lasts from

- A) from 4 to 7 years of age
- B) from 13 to 14 years of age
- C) from 8 to 12 years of age
- D) from 15 to 16 years of age

2 Dental age is used to determine

- A) somatoscopic indicators
- B) calendar age
- C) somatometric indicators
- D) biological age

3 When a functionally immature child enters school, there is

- A) high mental activity
- B) a long period of adaptation to learning activity
- C) low fatigue
- D) high fatigue

4 The science that studies the functions of the body and its organs is called

- A) histology
- B) physiology
- C) anatomy
- D) morphology

5 The individual development of an organism is called

- A) phylogenesis
- B) anthropogenesis
- C) systemogenesis
- D) ontogenesis

6 Non-simultaneous maturation of different organs and systems is called

- A) reliability
- B) homeostasis
- C) heterochronism
- D) harmony

7. A child's readiness to study at school is determined by

- A) by the level of mental and physical development, coordination abilities

- B) only by the level of physical development
- C) only by the level of mental development
- D) only by coordination abilities

8. Acceleration is understood as

A) accelerated rate of development of the organism in comparison with previous generations

B) all-round development

C) average level of development

D) a slower rate of development of the organism compared to previous generations

9. Children with functional disorders belong to the following health groups

A) fourth

B) first

C) second

D) fifth

10. the energetic rule of "skeletal muscles" was formulated by

A) I. A. Arshavsky

B) A. A. Markosyan

C) P. K. Anokhin

D) I. P. Pavlov

11. Nervous regulation is carried out with the help of

A) mechanical stimuli

B) hormones

C) enzymes

D) electrical impulses

12. The formation of the arch of the foot ends

A) in adolescence

B) when the child begins to walk

C) by the time of birth

D) by the age of 3 - 5 years

13. The earliest to mature in the process of ontogenesis is the department of the analyser

A) adolescent

B) conductive

C) cortical

D) receptor

14. Colour vision is provided by

A) hair cells

B) rods and cones

C) cones

D) rods

15. Receptors that perceive sound are located in

- A) eardrum
- B) the outer ear
- C) the cochlea of the inner ear
- D) middle ear

16. The upper limit of hearing in children reaches

- A) 18 thousand Hz
- B) 16,000 Hz
- C) 22 thousand Hz
- D) 12 thousand Hz

17. The structural unit of the nervous system is

- A) axon
- B) dendrite
- C) neuron
- D) neuroglia

18. The greatest acuity of hearing is characteristic of children

- A) 5 - 6 years old
- B) 14 - 19 years old
- C) 7 - 8 years old
- D) 12 - 13 years old

19. The central nervous system includes

- A) brain and spinal cord
- B) nerve bundles
- C) nerves and their plexuses
- D) plexuses around organs

20. Deformity of the longitudinal and transverse arch of the foot is

- A) scoliosis
- B) kyphosis
- C) flatfoot
- D) lordosis

21. The growth of which glands occurs before the age of 30

- A) epiphysis
- B) pituitary gland
- C) adrenal glands
- D) thyroid gland

22. What substances predominate in children in bone tissue

- A) organic
- B) mineral
- C) trace elements
- D) water

23. Until what age does muscle growth continue to grow in length

- A) 20 years
- B) 30 - 35 years
- C) 15 years
- Г) 23 - 25

24. Heat transfer and relative skin surface area are higher

- A) in children
- B) in old people
- C) in adolescents
- D) in adulthood

25. The respiratory function of the blood involves

- A) leucocytes
- B) red blood cells
- C) platelets
- D) lymphocytes

26. A child's speech develops especially intensively at the age of

- A) from 1 to 3 years old
- B) from 1.5 to 2 years
- C) from 4 to 5 years
- D) from 6 to 7 years old

27. Children's baby teeth begin to erupt

- A) at 6 months of age
- B) at 8 months
- C) at 9 months
- D) at 4 months

28. It is necessary to train inhibition processes in a child with nervous processes of

- A) strong unbalanced ones
- B) strong balanced inert
- C) weak
- D) strong balanced mobile.

29. In the lungs occurs

- A) gas exchange
- B) purification of air
- C) humidification of air
- D) warming of the air

30. Schoolchildren have predominant memory

- A) verbal-logical, arbitrary
- B) verbal-logical, involuntary
- C) visual and figurative, involuntary

|                                     |  |
|-------------------------------------|--|
| D) visual and figurative, arbitrary |  |
|-------------------------------------|--|