Assessment tools for midterm assessment

“Human Genetics”

Curriculum	31.05.01
Specialty	General Medecine
Form of education	Full-time
Designer Department	Morphology and physiology
Graduate Department	Internal Diseases

Sample tasks and tests

Term 5

Section № 1. Patterns of inheritance.

Topic 1.6. Mendelism (hybridological method, the laws of inheritance of G. Mendel's traits, the discreteness of heredity).

Task 1. List of questions for oral questioning:

1. Stages of the development of modern genetics, the discoveries of G. Mendel.
2. The hybridological method of G. Mendel.
3. The laws of inheritance of traits established by G. Mendel.
4. The laws of determination or uniformity of hybrids of the first generation.
5. The laws of splitting features.
6. The hypothesis of the purity of gametes.
7. The law of independent combination of features.
8. Conditions for the implementation of the laws of G. Mendel.
9. Discreteness of heredity.

Task 2. List of test questions:

Choose one correct answer.

1. According to the second Mendel's law, genotype splitting occurs in accordance with
   1) 1:1 **2) 1:2:1** 3) 3:1 4) 9:3:3:1
2. According to the law of independent inheritance of traits, splitting by phenotype occurs in accordance with
   1) 1:1 2) 1:2:1 3) 3:1 **4) 9:3:3:1**

Task 3. Examples of genetic problems.

Task № 1:

There are two types of hereditary blindness, each of which is determined by its recessive gene (a or b). Both alleles are located in different pairs of chromosomes and do not interact with each other. Determine the genotypes of parents suffering from various types of blindness (digomozygous), possible genotypes and phenotypes of offspring, the probability of having blind children from such a marriage.

Answer:

1) genotypes of parents suffering from various types of blindness:
♀(mother) – AAbb (gametes Ab), ♂ (father) – aaBB (gametes aB);
2) phenotypes and genotypes of descendants – all have normal vision, AaBb;
3) the probability of having blind children in this family is 0%, since the recessive genes of two types of blindness have passed into a heterozygous state and do not manifest themselves in the phenotype of children.

Topic 1.7. The chromosomal theory of heredity.

Task 1. List of questions for oral questioning:

1. The cell cycle.
2. Mitosis.
3. Meiosis.
4. Chromosomal types of sex determination.
5. Inheritance of traits linked to gender.
6. Primary non-divergence of sex chromosomes.
7. Secondary non-divergence of sex chromosomes.
8. Chromosomes-groups of gene coupling.
9. T. G. Morgan's theory of heredity.
10. Types of inheritance of features.
11. Autosomal dominant type of inheritance.
12. Autosomal recessive type of inheritance.

13. Dominant, gender-linked type of inheritance.
14. Recessive, gender-linked type of inheritance.
15. The Holandric type of inheritance.

Task 2. List of test questions:

Select one or more correct answers.

1. The chromosomal theory of heredity was created by an American geneticist:
   a) T. Morgan b) G. Mendel c) A. Weisman d) K. Correns
2. The gene is:
   a) protein section
   b) a unit of the type
   c) a unit of hereditary information
   d) part of the genome

Task 3. Examples of genetic problems.

When crossing spotted normal-haired rabbits with completely colored Angora rabbits, the hybrids were spotted normal-haired. In the offspring from the analyzing crossing, the following were obtained:
52-spotted Angora;
288-completely painted angora;
46-completely colored normal-haired;
314-spotted normal-haired.
Explain the results.
Answer: 14%

Topic 1.8. Structure and functions of genetic material.

Task 1. List of questions for oral questioning:

1. Discreteness of units of heredity-factors according to G. Mendel.
2. A gene is a unit of mutation, recombination and function.
3. One gene-one enzyme.
4. Proof of the genetic role of the DNA molecule and the discovery of its structural organization.
5. One gene-one polypeptide chain.
6. Gene-cystron.
7. A gene is a section of DNA (or RNA in some viruses).
8. The structure of the DNA molecule.
9. The sequential transmission of genetic information in the cell.

Task 2. List of test questions:

1. The composition of nucleic acids includes atoms
   a) C, H, O, N, P
   b) C, H, O, N, S
   c) C, H, O, P, S
   d) C, H, N, P, S
2. There are
   a) two types of nucleic acids
   b) three types
   c) one type
   d) depending on the functions performed by the cell

Task 3. Examples of genetic problems.

One of the DNA strands has a sequence of nucleotides:
AGT, AZZ, GAT, ATST, TSGA, TTT, ATSG…
What sequence of nucleotides does the second chain of the same molecule have?
Solution. According to the principle of complementarity, we complete the second chain (A-T, G-C). It will look like this: TTSA, TGG, TSTA, TGA, GTST, AAA, TGTS ....

Topic 1.9. Multilevel organization of the genome.

Task 1. List of questions for oral questioning:

1. What is the genome?
2. The genome of bacteria.
3. The genome of RNA viruses.
4. Eukaryotic genome.
5. Chromosomal level of organization of genetic material.
6. Chromatin packing levels.
7. Structural and functional organization of chromosomes.
8. Euchromatin and heterochromatin
9. The structure of polytene chromosomes and chromosomes of the "Lamp brushes" type.
10. The gene level of the organization of the genetic material.
11. Classification of genes that control matrix processes.
12. Ribosomal RNA genes.
13. Genes encoding structural proteins and enzymes.
14. tRNA genes.

Topic 1.10. Interaction of allelic and non-allelic genes.

Task 1. List of questions for oral questioning:

1. Interaction of allelic genes
2. The dominance of normal and mutant alleles.
3. Incomplete dominance.
4. Codominization.
5. Overdomination.
6. Unstable and conditional dominance.
7. Multiple alleles.
8. The ratio of the phenotype for different types of interaction of alleles.
9. On the mechanisms of dominance and recessiveness.
10. Interaction of non-allelic genes.
11. Complementarity.
12. Dominant and recessive epistasis.
13. Double recessive epistasis.
14. Modifier genes.
15. Interaction of genes functioning in early embryonic development.
16. Polygenic inheritance of qualitative and quantitative traits

Task 2. List of test questions:

Choose one correct answer.

1. MULTIPLE ALLELISM MEANS THE PRESENCE IN POPULATIONS OF:
    1. Several genes responsible for the formation of a single trait.
    2. Several alleles of the gene responsible for the formation of different traits.
    3. Several alleles of the gene responsible for the formation of alternative manifestations of the trait.
    4. Several dominant alleles, the joint action of which enhances the manifestation of the trait.
2. INCOMPLETE DOMINANCE IS MANIFESTED BY THE SPLITTING OF TRAITS IN HYBRIDS IN THE RATIO:
    1. 1:2:1 by genotype and phenotype.
    2. 1:2:1 by genotype and 3:1 by phenotype.
    3. 3:1 by genotype and 1:2:1 by phenotype.
    4. 1:1 by phenotype and genotype.

Task 3. Examples of genetic problems.

1. Healthy parents had a son with hemophilia and color blindness. It is known that his wife's father was colorblind. Determine the probability of giving birth to the next child with two anomalies at the same time, given that the genes of hemophilia and color blindness are located on the X chromosome at a distance of 9.8 morganids.

Answer: 2.45 %.

Topic 1.11. Gene coupling and crossing-over. Genetics of sex.

Task 1. List of questions for oral questioning:

1. The laws of linked inheritance.
2. Full grip. Incomplete coupling. Crossing over.
3. Determining the distance between genes.
4. Proof of the linear arrangement of genes in the chromosome.
5. Accounting for double crossing.
6. Interference.
7. Gene mapping. Genetic maps. Cytological maps. Comparison of genetic and cytological maps.
8. Unequal crossing over. Somatic crossing-over. Facts affecting crossing over.
9. Genetics of sex.
10. The main types of sex determination.
11. Types of chromosomal determination of sex.
12. Chromosomal and molecular genetic bases of sex determination in drosophila.
13. Gynandromorphism.
14. K. Bridges ' balance theory.
15. Sex-altering genes.
16. Molecular and genetic mechanisms of sex determination in drosophila.
17. Chromosomal and molecular genetic bases of primary determination of sex in humans.
18. The role of the Y chromosome in sex determination.
19. The role of autosomal genes in sex determination.
20. Secondary determination of sex in humans.
21. Gender-dependent and gender-restricted signs.
22. Sex and reproduction in animals and humans.

Task 2. List of test questions:

1. Color blindness in humans is inherited as
   a) autosomal, dominant trait
   b) recessive, linked and X-chromosome trait
   c) autosomal, recessive trait
   d) dominant, linked and X-chromosome trait
2. What is the probability of having healthy children of men suffering from hemophilia, and healthy (homozygous for the gene of hemophilia) women (recessive gene that causes hemophilia is localized in the X chromosome)?
   a) 100% of children
   b) 50% of children
   C) 50% sons
   d) 25% sons

Task 3. Examples of genetic problems.

In humans, the absence of sweat glands manifests itself as a recessive trait linked to the sex. Albinism is caused by an autosomal recessive gene. One married couple, normal for these two signs, had a boy with both anomalies. Specify the genotype of the son, the probable genotypes of the parents, as well as the probability of the birth of a second child with the same anomalies.

Answer: 50% of sick boys.

Section № 2. Variability (3rd course)

Topic 2.3. Variation of the manifestation of hereditary traits in the individual development of organisms. Modification and reaction rate.

Task 1. List of questions for oral questioning:

1. Determination of variability and its main forms.

2. What is the reaction rate, what is its dependence on the genotype?
3. Examples of modification variability of traits in humans.
4. The practical significance of the group nature of modifications.
5. What is the essence of the statistical method for studying modification variability?
6. What is the difference between mutations and modifications?
7. What are the types of genotypic variability?
8. What is combinative variability? What are its causes?
9. What role does combinative variability play in the diversity of individuals and the manifestation of signs?
10. What are the principles of classification of mutations?
11. What are the causes of mutations?
12. What is the role of mutations in human pathology?
13. What is the evolutionary significance of various forms of variability?
14. Heterogeneous groups.
15. Penetrance.
16. Expressiveness.
17. The reaction rate.

Task 2. List of test questions:

1. Choose one correct answer. A violation of the protein structure can occur when the nucleotide sequence changes:

1. The promoter. **2. Exon.** 3. Intron. 4. Spacer.

2. Reduce the frequency of gene mutations processes:

1. Reparations. 2. Replication. 3. Regeneration. 4.Crossing over.

Task 3. Examples of genetic problems.

Congenital hip dislocation inherited autosomal dominant with 25% penetrance. What is the probability of having a sick child from parents, one of whom is heterozygous on this basis?

Answer: 12.5%.

Topic 2.4. Theoretical foundations of mutational variability.

Task 1. List of questions for oral questioning:

1. General classification of mutations.
2. Genomic mutations.
3. Chromosomal mutations.
4. Gene mutations.
5. Molecular mechanisms of gene mutations.
6. Reverse mutations and suppressors.

Task 2. The list of topics of the abstracts.

1. General classification of mutations.
2. Genomic mutations.
3. Chromosomal mutations.
4. Gene mutations.
5. Molecular mechanisms of gene mutations.
6. Reverse mutations and suppressors.

Topic 2.5. Spontaneous mutation process. Mutagenesis inhibitors. Detection of mutagens.

Task 1. List of questions for oral questioning:

1. Factors affecting the spontaneous mutation process.
2. Accounting for spontaneous mutations in humans.
3. General regularities of the spontaneous mutation process.
4. The law of homological series of hereditary variability.
5. Mutagenesis inhibitors.
6. Detection of mutagens.
7. Mutagenic environmental factors.
8. Mutagenicity testing strategy

9. Test systems.

Task 2. The list of topics of the abstracts.

1. Factors affecting the spontaneous mutation process.
2. Accounting for spontaneous mutations in humans.
3. General regularities of the spontaneous mutation process.
4. The law of homological series of hereditary variability.
5. Mutagenesis inhibitors.
6. Detection of mutagens.
7. Mutagenic environmental factors.
8. Mutagenicity testing strategy
9. Test systems.

Topic 2.6. Non-chromosomal inheritance.

Task 1. List of questions for oral questioning:

1. Plastic (chloroplast) genome.
2. The mitochondrial genome.
3. The mitochondrial genome of plants.
4. Genetic control of cytoplasmic male sterility of plants (CMS)
5. The mitochondrial genome of yeast.
6. The genome of human mitochondria.
7. About the origin of mitochondria.
8. The maternal effect of the cytoplasm.

Task 2. The list of topics of the abstracts.

1. Plastic (chloroplast) genome.
2. The mitochondrial genome.
3. The mitochondrial genome of plants.
4. Genetic control of cytoplasmic male sterility of plants (CMS)
5. The mitochondrial genome of yeast.
6. The genome of human mitochondria.
7. About the origin of mitochondria.
8. The maternal effect of the cytoplasm.

Section № 3. The genetic basis of evolution (3rd course)

Topic 3.1. Genetics and ontogenesis.

Task 1. List of questions for oral questioning:

1. Stages of ontogenesis.
2. Determination.
3. Ooplasmic segregation.
4. Genetic control of segmentation.
5. Homeosis genes.
6. Homeoboxes in humans and hereditary diseases.

Task 2. The list of topics of the abstracts.

1. Stages of ontogenesis.
2. Determination.
3. Ooplasmic segregation.
4. Genetic control of segmentation.
5. Homeosis genes.
6. Homeoboxes in humans and hereditary diseases.

Topic 3.2. Genes controlling embryonic induction.

Task 1. List of questions for oral questioning:

1. Induction and organogenesis.
2. Genetic factors of vertebrate morphogenesis.

3. A model of gene interaction during early development on the example of kidney development in a mouse.
4. Genes important for early development on the example of a kidney in a mouse.

Task 2. The list of topics of the abstracts.

1. Induction and organogenesis.
2. Genetic factors of vertebrate morphogenesis.
3. A model of gene interaction during early development on the example of kidney development in a mouse.
4. Genes important for early development on the example of a kidney in a mouse.

Topic 3.3. The genetic foundations of evolution. Population genetics.

Task 1. List of questions for oral questioning:

1. The concept of the population.
2. The frequency of genotypes and alleles in the population.
3. The Hardy-Weinberg law and the conditions for its implementation.
4. Factors of the dynamics of the genetic structure of the population (absence of panmixia, gene drift, mutation process, migration, selection).
5. The concept of fitness and selection coefficient.
6. The influence of selection on the genetic structure of the population.
7. Intrapopulation genetic polymorphism and genetic cargo.

Task 2. List of test questions:

Choose one correct answer.

1. What is the gene pool of a population?
   - **a) the totality of genotypes of all individuals of the population**
   - b) the set of phenotypes of all individuals of the population
   - c) the ratio of different genotypes and alleles of genes in the population
   - d) the ratio in the population of individuals of different sexes.
2. What is the genetic structure of a population?
   - a) the totality of genotypes of all individuals of the population
   - b) the set of phenotypes of all individuals of the population
   - **c) the ratio of different genotypes and alleles of genes in the population**
   - d) the ratio in the population of individuals of different sexes.

Task 3. Examples of genetic problems.

Out of 84,000 children born within 10 years in maternity hospitals in the city of K., 210 children were found to have a pathological recessive trait d (genotype dd). Define:

A) genotype frequency;

B) how many newborns have one child with DD genotype

Answer: a) 0.0025; b) 1/400.

Topic 3.4. Synthetic theory of evolution. Genetics and problems of evolutionary theory. Evolution of the human genome.

Task 1. List of questions for oral questioning:

1. The synthetic theory of evolution.
2. Genetics and problems of evolutionary theory.
3. The evolution of the human genome.

Task 2. The list of topics of the abstracts.

1. The synthetic theory of evolution.
2. Genetics and problems of evolutionary theory.
3. The evolution of the human genome.

Section № 4. Hereditary diseases (3rd course)

Topic 4.2. Chromosomal abnormalities and associated syndromes.

Task 1. List of questions for oral questioning:

1. Classification of chromosomal abnormalities in humans.
2. Characteristics of intra-and interchromosomal rearrangements.
3. The scheme of recording numerical and structural anomalies of chromosomes.
4. Clinical manifestations of chromosomal syndromes.
5. Clinical and genetic characteristics of syndromes associated with anomalies in the number of autosomes.
6. Trisomy on the 21st chromosome, or Down syndrome (DS)
7. Trisomy on the 18th chromosome, or Edwards syndrome (ES)
8. Trisomy on the 13th chromosome, or Patau syndrome (PS)
9. Clinical and genetic characteristics of syndromes associated with abnormalities in the number of sex chromosomes.
10. X-chromosome monosomy, or Shershevsky-Turner syndrome (STS)
11. Polysomies on the X-chromosome in women.
12. X-chromosome polysomies in men.
13. Polysomy on the Y-chromosome.
14. Variants of gonadal dysgenesis in sex chromosome abnormalities.

Task 2. The list of topics of the abstracts.

1. Classification of chromosomal abnormalities in humans.
2. Characteristics of intra-and interchromosomal rearrangements.
3. The scheme of recording numerical and structural anomalies of chromosomes.
4. Clinical manifestations of chromosomal syndromes.
5. Clinical and genetic characteristics of syndromes associated with anomalies in the number of autosomes.
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8. Trisomy on the 13th chromosome, or Patau syndrome (PS)
9. Clinical and genetic characteristics of syndromes associated with abnormalities in the number of sex chromosomes.
10. X-chromosome monosomy, or Shershevsky-Turner syndrome (STS)
11. Polysomies on the X-chromosome in women.
12. X-chromosome polysomies in men.
13. Y-chromosome polysomy.
14. Variants of gonadal dysgenesis in sex chromosome abnormalities

Topic 4.3. Monogenic human diseases.

Task 1. List of questions for oral questioning:

1. Epidemiology of monogenic diseases.
2. Etiology of monogenic diseases.
3. The scheme of recording mutations in human genes.
4. Genetic heterogeneity and clinical polymorphism of monogenic diseases.
5. Pathogenesis of monogenic diseases.
6. Clinical and genetic characteristics of monogenic diseases with Mendelian inheritance.
7. Autosomal dominant monogenic diseases.
8. Characteristics of the autosomal dominant type of inheritance.
9. Hereditary motor-sensory neuropathy type 1A (OMIM:118220).
10. Diseases of ion channels.
11. Collagenopathy.
12. Autosomal recessive monogenic diseases.
13. Characteristics of the autosomal recessive type of inheritance.
14. Cystic fibrosis (cystic fibrosis).
15. Proximal spinal amyotrophy.
16. Monogenic syndromes of violation of sexual differentiation according to the female type.

17. Monogenic syndromes of violation of sexual differentiation by male type.

Task 2. The list of topics of the abstracts.

1. Epidemiology of monogenic diseases.
2. Etiology of monogenic diseases.
3. The scheme of recording mutations in human genes.
4. Genetic heterogeneity and clinical polymorphism of monogenic diseases.
5. Pathogenesis of monogenic diseases.
6. Clinical and genetic characteristics of monogenic diseases with Mendelian inheritance.
7. Autosomal dominant monogenic diseases.
8. Characteristics of the autosomal dominant type of inheritance.
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10. Diseases of ion channels.
11. Collagenopathy.
12. Autosomal recessive monogenic diseases.
13. Characteristics of the autosomal recessive type of inheritance.
14. Cystic fibrosis (cystic fibrosis).
15. Proximal spinal amyotrophy.
16. Monogenic syndromes of violation of sexual differentiation according to the female type.
17. Monogenic syndromes of violation of sexual differentiation by male type.

Topic 4.4. Diseases with non-traditional types of inheritance (diseases inherited linked to sex, mitochondrial).

Task 1. List of questions for oral questioning:

1. Diseases inherited concatenated with gender.
2. Characteristics of the X-linked recessive type of inheritance.
3. Progressive Duchenne/Becker muscular dystrophy
4. Testicular feminization syndrome (TFS).
5. Characteristics of the X-linked dominant type of inheritance.
6. Hereditary motor-sensory neuropathy of type IX.
7. Characteristics of the Y-linked (Holandric) type of inheritance.
8. Mitochondrial diseases.
9. Etiology and pathogenesis of mitochondrial diseases.
10. General characteristics of mitochondrial diseases caused by mutations in the mitochondrial genome.
11. The main clinical manifestations of mitochondrial diseases.
12. Biochemical diagnostics of mitochondrial diseases.
13. Clinical and genetic features of the main mitochondrial diseases.
14. Kerns-Sayre syndrome.
15. MELAS syndrome (mitochondrial encephalopathy, lactic acidosis and stroke-like episodes)
16. Multiple mtDNA deletion syndrome.

Task 2. The list of topics of the abstracts.

1. Diseases inherited concatenated with gender.
2. Mitochondrial diseases.

Topic 4.5. Diseases with non-traditional types of inheritance (genomic imprinting(DGI), expansion of trinucleotide repeats(DETR), prion diseases (PD)).

Task 1. List of questions for oral questioning:

1. Genomic imprinting diseases (GID).
2. Etiology and pathogenesis of genomic imprinting diseases.
3. Clinical and genetic characteristics of the main diseases of genomic imprinting.
4. Prader-Willi syndrome (PWS).
5. Engelman Syndrome (ES)

6. Diseases of the expansion of trinucleotide repeats (DETR)
7. General characteristics of the DETR.
8. Clinical and genetic features of some DETR
9. Huntington's chorea HG.
10. Kurschmann-Steinert-Batten myotonic dystrophy
11. Brittle X-chromosome syndrome, or Martin-Bell syndrome.
12. Prion diseases (PD).

Task 2. The list of topics of the abstracts.

1. Diseases of genomic imprinting (DGI).
2. Diseases of the expansion of trinucleotide repeats (DETR)
3. Prion diseases (PD).

Topic 4.6. General characteristics and classification of hereditary metabolic diseases (amino acids (aminoacidopathy), carbohydrates).

Task 1. List of questions for oral questioning:

1. General characteristics and classification.
2. Hereditary diseases of amino acid metabolism (aminoacidopathy).
3. Hyperphenylalaninemia (HPhA)
4. Phenylketonuria
5. Phage-independent HPhA
6. Transient forms of HPhA
7. Diagnosis and treatment of HPhA
8. Albinism
9. Hereditary diseases of carbohydrate metabolism.
10. Galactosemia.
11. Glycogenoses.

Task 2. The list of topics of the abstracts.

1. General characteristics and classification.
2. Hereditary diseases of amino acid metabolism (aminoacidopathy).
3. Hyperphenylalaninemia (HPhA)
4. Phenylketonuria
5. Phage-independent HPhA
6. Transient forms of HPhA
7. Diagnosis and treatment of HPhA
8. Albinism
9. Hereditary diseases of carbohydrate metabolism.
10. Galactosemia.
11. Glycogenoses.

Topic 4.7. Hereditary metabolic diseases (lipids, erythron, lysosomal and peroxisomal).

Task 1. List of questions for oral questioning:

1. Hereditary diseases of lipid metabolism.
2. Familial hypercholesterolemia (FH)
3. Hereditary erythron diseases.
4. Non-spherocytic anemia.
5. Glucose-6-phosphate dehydrogenase deficiency
6. Non-spherocytic hemolytic anemia
7. Hemoglobinopathies
8. Erythrocyte membranopathies.
9. Lysosomal diseases.
10. Mucopolysaccharidoses.
11. Sphingolipidosis.
12. Metachromatic leukodystrophy.

13. Peroxisomal diseases.
14. Zellweger Syndrome

Task 2. The list of topics of the abstracts.

1. Hereditary diseases of lipid metabolism.
2. Familial hypercholesterolemia (FH).
3. Hereditary erythron diseases.
4. Non-spherocytic anemia.
5. Insufficiency of glucose-6-phosphate dehydrogenase.
6. Non-spherocytic hemolytic anemia.
7. Hemoglobinopathies.
8. Erythrocyte membranopathies.
9. Lysosomal diseases.
10. Mucopolysaccharidoses.
11. Sphingolipidosis.
12. Metachromatic leukodystrophy.
13. Peroxisomal diseases.
14. Zellweger syndrome.

Topic 4.8. Genetics of widespread diseases. Prevention of hereditary pathology. Treatment of hereditary diseases.

Task 1. List of questions for oral questioning:

1. General characteristics and genetic mechanisms of widespread diseases.
2. Mathematical analysis of the mechanisms of development of diseases with hereditary predisposition (DHP)
3. Molecular genetic analysis of the mechanisms of DHP development.
4. The method of experimental crossing of model animals.
5. Clinical and genetic features of some diseases with hereditary predisposition.
6. Genetic aspects of carcinogenesis.

Task 2. The list of topics of the abstracts.

1. General characteristics and genetic mechanisms of widespread diseases.
2. Mathematical analysis of the mechanisms of development of diseases with hereditary predisposition (DHP)
3. Molecular genetic analysis of the mechanisms of DHP development.
4. The method of experimental crossing of model animals.
5. Clinical and genetic features of some diseases with hereditary predisposition.
6. Genetic aspects of carcinogenesis.

Task 3. List of test questions:

4. Genes localized in the Y-chromosome are transmitted...

a) from the father to the sons
b) from the father to the daughters
c) from the mother to the sons
d) from the mother to the daughters

5. Color blindness in humans is inherited as

a) autosomal, dominant trait
b) recessive, linked and X-chromosome trait
c) autosomal, recessive trait
d) dominant, linked and X-chromosome trait

Topics of the final control work (Term 5)

List of abstract topics:

1. The history and significance of genetics.
2. The structure of nucleic acids.
3. DNA replication.

4. Genetic material of viruses and prokaryotes.
5. Organization of the eukaryotic genome.
6. Cell cycle and mitosis.
7. Meiosis.
8. Basic genetic concepts and symbols.
9. Interaction of genes.
10. Interaction of genotype and environment.
11. Genetics of sex and gender-linked inheritance.
12. Mutations.
13. Recombination.
14. Transpositions.
15. Reparation.
16. Modifications.
17. Structural and functional organization of the gene.
18. The gene code.
19. Gene expression.
20. Transfer of genetic information in nature.
21. Regulation of gene expression.
22. Genetic engineering.
23. The genetic foundations of evolution.
24. Problems of genetic determination of human behavior.
25. Man as an object of genetics.
26. Human karyotype in normal and pathological conditions.
27. Human genetic diseases.
28. Diseases with a hereditary predisposition.
29. Oncogenetics.
30. Medical and genetic counseling.
31. The history of psychogenetics.
32. Methods of psychogenetics.
33. The relationship of genotype and environment in psychogenetics.
34. Formation of individual differences in ontogenesis.
35. Genetic psychophysiology.
36. Psychogenetics of intelligence.
37. Psychogenetics of development and heredity.
38. Psychogenetics of deviant behavior.
39. Determination. Problems of determination processing.
40. Regulatory genes in the process of ontogenesis.
41. Theoretical aspects of human genetics.
42. Determination of gender in ontogenesis.
43. Differentiation of gender.