

End-of-course examination in the discipline  
Medical Biology and General Genetics  
For students studying in the specialty:  
7-07-0912-01 «Pharmacy»



APPROVED  
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## Test #00

### I. Choose one or more correct answers and write them to the table:

- 1. Methods of cytology are:** a) light and electron microscopy, cytogenetic karyotyping; b) isotopic labeling and differential centrifugation; c) cytogenetic karyotyping and cell microsurgery; d) genealogical and cytochemical; e) X-ray crystallography and twin study.
- 2. Transport of substances into the cell that requires ATP energy is:** a) transport of ions into the cell down the concentration gradient; b) phagocytosis; c) pinocytosis and diffusion; d) osmosis and endocytosis; e) transport of substances into the cell against the concentration gradient.
- 3. Functions of peroxisomes:** a) splitting of proteins and polysaccharides; b) oxidation of amino acids with production of  $H_2O_2$ ; c) synthesis of polysaccharides and fats; d) heterophagy and oxidation of amino acids with production of  $H_2O_2$ ; e) destruction of larval organs in animals having indirect development and autophagy.
- 4. Idiogram is:** a) non-systematized image of karyotype; b) systematized image of karyotype; c) order of genes in a chromosome; d) order of nucleotides in a gene; e) scheme or photograph of chromosomes arranged by their size.
- 5. Consequences resulting from arrangement of genetic material at the gene level:** a) genetic linkage; b) independent inheritance of genes; c) mutations of genes; d) crossing-over and interactions of genes; e) intraallelic interactions of genes and genetic linkage.
- 6. Penetrance is the gene property to:** a) mutate; b) determine synthesis of the certain polypeptide; c) be responsible for development of several characters; d) vary the degree of its phenotypic manifestation; e) have different frequency of phenotypic manifestations.
- 7. The roles of structural genes:** a) code for repressor protein; b) code for enzymes; c) code for histones; d) code for various types of RNA; e) code for various RNA and repressor.
- 8. Criteria of cytoplasmic heredity are:** a) segregation of characters occurs in accordance with Mendel's laws; b) segregation of characters does not correspond to Mendel's laws; c) it is possible to reveal linkage groups; d) inheritance goes on mother's line; it is not possible to reveal linkage groups; e) identical results of recurrent crossings.
- 9. Enzymes used in genetic engineering:** a) DNA-polymerases; b) lipases and restriction enzymes; c) revertases and restriction enzymes; d) restriction enzymes and amylases; e) ligases.
- 10. Characteristics of complementation:** a) mutual influence of different genes situated in adjacent loci of the same chromosome; b) two dominant alleles of different genes are required for development of a trait; c) two recessive alleles of different genes are required for development of a trait; d) dominant or recessive allele of one gene suppresses effect of dominant or recessive allele of another gene; e) alleles of different genes have effect on degree of character's development.
- 11. Barr body is:** a) inactivated X-chromosome; b) inactivated Y-chromosome; c) active X-chromosome; d) active X-chromosome; e) inactivated X-or Y-chromosomes.
- 12. Characteristics of somatic mutations:** a) occur in gametes; b) occur in somatic cells; c) have phenotypic manifestation in the individual who got them; d) are transmitted to descendants during sexual reproduction; e) are transmitted to descendants during asexual reproduction.
- 13. Mutations of functional genes cause:** a) transpositions; b) impaired alternation of recognition and termination; c) impaired alternation of initiation and elongation; d) impaired alternation of induction and repression; e) transitions.
- 14. Studying the human being has a number of difficulties such as:** a) simple karyotype; b) early sexual maturation; c) low number of children; d) high number of children; e) possibility to conduct experiments.
- 15. Biochemical genetic tests study:** a) complete blood count; b) activity of enzymes; c) activity of digestion; d) composition of primary urine; e) structure of enzymes in a crystal.

## II. Fill in the gaps and write your answer to the table:

16. The number of muscle layers in the body wall of ascaris is ...
17. Type of gastrulation in case of which cells of the blastoderm migrate to the blastocoel and multiply to form the second germ layer is called ...
18. Men having female body constitution, gynecomastia and impairment of spermatogenesis is example of a person sick with ... syndrome.
19. During diplotene chromosomes of bivalents are connected only in the crossing regions called ...
20. The receptor apparatus located on the outer surface of a plasma membrane is called ...

## III. Solve the problems and write your answers to the table:

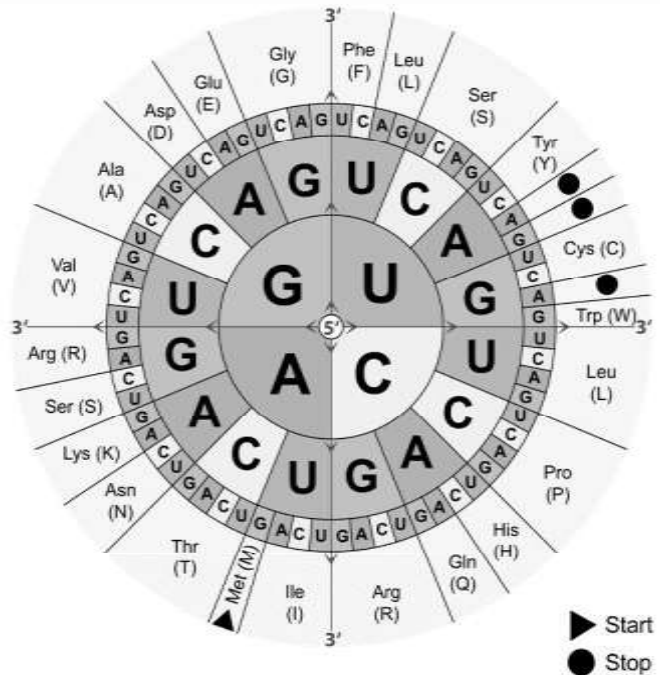
21. A blue-eyed male married a brown-eyed female. Her father was blue-eyed and mother was brown-eyed. It's known that the allele of brown eyes is dominant. What phenotypes of children could be expected in this family and what is their chance?

22. A fragment of a DNA strand has the following nucleotide sequence:

5' - G A G G C T C T A G G T A C C A G T - 3'.

The other strand was the template for mRNA. Find the amino acids encoded in this DNA fragment?

23. The concordance of monozygotic and dizygotic twins in body mass is 80% and 30%. What is the degree of genetic determination of body mass? What is the influence of the environment on this trait?.



Compiler

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