

End-of-course examination in the discipline
Medical Biology and General Genetics
For students studying in the specialty:
7-07-0911-01 «General Medicine»



APPROVED
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Test #00

I. MULTIPLE CHOICE (3 points per question)

Choose 1, 2 or 3 correct choices and write them to the table. Incomplete answers are not accepted.

- Methods of cytology are:** a) light and electron microscopy, ultrasonography; b) isotopic labeling and differential centrifugation; c) PCR and cell microsurgery; d) genealogical and cytochemical; e) X-ray crystallography and twin study.
- Plasma membrane contains:** a) bilayer of carbohydrates; b) bilayer of lipids; c) two layers of proteins covering the surface of the membrane; d) peripheral proteins; e) integral proteins.
- Structural-functional levels of eukaryotic genetic material:** a) chromosome, gene and genome levels; b) chromosome, cellular, genome levels; c) genome and subcellular levels; d) cellular, organism, gene levels; e) organism and population levels.
- The role of operator** a) codes for repressor protein; b) codes for enzymes; c) participates in switching the work of structural genes on and off; d) codes for mRNA; e) regulates activity of functional genes.
- Characteristics of polymeric gene action:** 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) one gene has effect on several characters; e) alleles of different genes have effect on degree of character's development.
- Loading tests are used to reveal:** a) heterozygotes carrying recessive pathological gene; b) chromosome mutations; c) genome mutations; d) gene mutations; e) inheritance type.
- Demographic characteristics of human populations:** a) the number of individuals and genetic composition; b) birth and death rates; c) panmixia and density; d) isolation and migration; e) age and gender composition.
- Symptoms of albinism are:** a) hyposensitivity to ultra-violet rays; b) milky-white skin color; c) hair depigmentation; d) hair pigmentation; e) decreased acuity of sight.
- Characteristics of sexual reproduction are:** a) usually two individuals participate in reproduction; b) only one individual participates in reproduction; c) genotypes of daughter individual differs from parental ones; d) genotypes of daughter individuals are identical to parental ones; e) the number of daughter individuals increases quickly.
- At the earliest stages of embryogenesis cells:** a) are totipotent; b) are determined; c) can differentiate into any cell; d) can differentiate only into some cells; e) cannot differentiate.
- Basic evolution directions of nervous system of chordates are:** 1) differentiation of the nerve tube into the brain and spinal cord; 2) transformation of the mammalian brain into the sauropsidian brain; 3) transformation of the ichthyopsidian brain into a sauropsidian one; 4) transformation of the sauropsidian brain into the ichthyopsidian one; 5) transformation of the sauropsidian brain into the mammalian brain; 6) development of the peripheral NS: a) 1, 2, 4, 6; b) 1, 3, 5, 6; c) 1, 2, 5, 6; d) 6; e) 1.
- Pathogenic actions of parasites are:** a) mechanical injury of tissues, toxicoallergic; b) supplying the host with vitamins; c) supplying the host with nutrients; d) absorption of nutrients and vitamins from the host; e) weakening the organism and increasing probability of secondary infection.
- Human becomes infected with taeniasis by:** a) ingestion of parasite's eggs; b) contacts with sick people; c) eating undercooked beef; d) eating undercooked pork; e) eating undercooked fish.
- Symptoms of enterobiasis:** a) disturbance of sleep and irritability; b) impairment of sight; c) abdominal pain; d) cough and eosinophilic pneumonitis; e) itch in the perianal area.
- Morphology of pubic louse:** a) body is short and wide in comparison with head lice, up to 10 mm in length; b) body is short and wide in comparison with head lice, about 1.5 mm in length; c) bodies are long, narrow, flattened, they are 3 pairs of legs; d) piercing and sucking mouthparts; e) chewing mouthparts.

II. FILLING IN THE GAPS (5 points per question)

Write the missing words or numbers. The answers with mistakes are not accepted.

- Endoplasmic reticulum and ... form the transport system of the cell.
- Consanguineous marriages lead to ... depression as relatives have higher probability to carry the same pathological gene.
- Free-living organisms which can become parasites if they get to the organism of other species are called ...
- The mass of undifferentiated cells capable of growth and differentiation beneath the wound epithelium is called ...
- In regular medical examination of kindergarten staff, 4-nucleated cysts were found in stool test of a kindergartner. What parasite do the cysts belong to?

III. SOLVE THE PROBLEMS (8 points per question)

Solve the problems. You must write the solution and the answer for the problem's question.

21. Leg muscles of a man spend approximately 24 kJ/min for running. How much glucose is required (if it is split completely) for 20 min of run? The molar mass of glucose is 180 g/mol).
22. Congenital deafness of human can be determined by two recessive genes: d and e. Normal hearing requires both dominant alleles (D and E). There is a family where parents are deaf while all they seven children have normal hearing. What are the most probable genotypes of the parents and all children?
23. Concordance of monozygotic and dizygotic twins in body mass is 80% and 30%. What is the role of heredity for this character?

IV. MICROPREPARATIONS (3 points per question)

Write the Latin name and taxonomy of the parasites.

24.



25.

