

Test: Biology (Entrance examination) For Moscow Pirogov Medical Research University

Question # 1. Endocrine glands

The endocrine glands produce

Select correct answer

- antibodies hormones enzymes vitamins

Save

Question # 2. Predation

Which is true and relevant to "predation"

Select correct answer

- both interacting species suffer
 one of the interacting species benefits, the other neither benefits nor suffers
 none of the interacting species benefits or suffers
 one of the interacting species benefits, the other suffers loss of life of an organism

Save

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Question # 3. Fertilization

The process of fertilization includes

Select correct answer

- differentiation of ovum fusion of male and female pronuclei sperm production
 meiosis of gametes

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Question # 4. Rods and cones

Light-sensitive receptors — rods and cones — are located in

Select correct answer

- retina cornea sclera lens

Save

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Question # 5. Microevolution

Limited resources of environment and intense multiplication of organisms are the reason of:

Select correct answer

- natural selection genetic drift formation of adaptations struggle for existence

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Question # 6. Genotype

The genotype is

Select correct answer

- the set of somatic cells chromosomes of an individual organism
 the set of all characteristics of an individual organism
 the set of all genes of an individual organism
 the set of observable characteristics of an individual organism

Save

Question # 7. Trematoda

Which is true and relevant to the class Trematoda?

Select correct answer

all are parasites larvae have a notochord digestive system has an anus body a rounded shape

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Question # 8. Source of energy

The main source of energy in the cell is

Select correct answer

RNA Proteins Cellulose ATP

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Question # 9. Blood clotting

What cells are involved in the process of blood clotting in humans?

Select correct answer

leukocytes lymphocytes platelets erythrocytes

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Question # 10. Parasitism

Which is true and relevant to "parasitism"

Select correct answer

- both interacting species suffer none of the interacting species benefits or suffers
- one of the interacting species benefits, the other neither benefits nor suffers
- one of the interacting species benefits, the other suffers

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Question # 11. Differentiation

At which stage of embryogenesis does the tissue differentiation begin?

Select correct answer

gastrula blastula morula zygote

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Question # 12. Flowering plants

Name the main characteristic of the Flowering plants (Angiosperms or Magnoliophyta)

Select correct answer

- formation of the fruit ability to photosynthesize cross-pollination
- presence of conductive tissues

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Question # 13. Expected ratio

What is the probability of the birth of a blue-eyed blond child from the blue-eyed, dark-haired father and the brown-eyed blonde mother if the parents are heterozygous for a dominant trait?

Select correct answer

12.5% 0.5 0.75 0.25

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Question # 14. Arachnida

The class Arachnida refers to

Select correct answer

Crustacea Cestod Insecta Acari

Question # 15. M. Shleyden and T. Shvann

What is the theory formulated by German scientists M. Shleyden and T. Shvann?

Select correct answer

- embryogenesis theory evolution theory chromosomal theory cell theory

Save

Question # 16. Bones strength

Bones strength depends mainly on the content of:

Select correct answer

- lipids calcium iodine proteins

Save

Question # 17. Migration of atoms

Biogenic migration of atoms provides

Select correct answer

- the ability of organisms to metabolism the ability of organisms to adaptation
 the ability of organisms to irritability the ability of organisms to self-regulation

Question # 18. Mesoderm

What develops from the mesoderm?

Select correct answer

- the renal tubular epithelial cells the neurons of the spinal cord the epithelium of the intestine
 the melanocytes of the skin

Question # 19. Ferns

Ferns unlike mosses there are

Select correct answer

- roots flowers stems foliage

Save

Question # 20. Linkage groups

Specify how many linkage groups are in the human genome?

Select correct answer

- 92 46 12 23

Question # 21. Big circle of blood

In the veins of a big circle of blood circulation in humans:

Select correct answers

- oxygen-rich blood flows the blood flows faster than in the capillaries
 blood flows from the heart blood flows more slowly than in capillaries
 blood flows to the heart flowing blood saturated with carbon dioxide

Question # 22. Chloroplasts

Specify the features of the structure and functions of chloroplasts:

Select correct answers

- they have outer and inner membranes
 they synthesize organic substances using the energy released during the oxidation of inorganic compound
 their enzymes break down biopolymers to monomers
 they characterized by anaerobic method of energy production
 they contains DNA and ribosomes they contain connected thylakoid

Question # 23. X-linked inheritance

Select features of X-linked recessive inheritance:

Select correct answers

- sons receive a sign from the mother a sign is observed mainly in men
 in each generation there are carriers of the sign father passes this sign to all his sons

not in every generation there are carriers of the sign a sign of in men and women meets equally often

Question # 24. Vertebrates

What are the common features of the organization of Vertebrates you can specify:

Select correct answers

- differentiation of the mantle and mantle cavity appearance of the excretory system consisting of individual cells development of jaws, apparatus for capturing and grinding food
- appearance of the heart and differentiation of blood circulation external skeleton formation
- progressive development of the forebrain and sensory organs

Question # 25. Ecosystems

In biogeocenosis:

Select correct answers

- Open biogeochemical cycles a branched food chain unbalanced biogeochemical cycles
- diverse species composition closed biogeochemical cycles among consumers is dominated by predators

Question # 26. Gametes

Sperm, in contrast to the egg, is characterized by:

Select correct answers

- haploid set of chromosomes a small amount of cytoplasm ability to to active movement
- larger sizes the presence of acrosome large supply of nutrients

Question # 27. Fungi

The similarity of fungi and animals is that:

Select correct answers

- they have unlimited growth in their cells contained vacuoles with cell sap
- they have a heterotrophic way of feeding. the cell wall of fungi and the integument of arthropods contain chitin they have an autotrophic way of feeding. their cells lack chloroplasts

Question # 28. Anthropogenesis

What factors of anthropogenesis can be attributed to social:

Select correct answers

- population waves natural selection social lifestyle oral and written speech
- home improvement genetic drift

Question # 29. Anabolism

In the process of anabolism occurs:

Select correct answers

- synthesis of inorganic substances formation of fibrinogen cholesterol synthesis
- synthesis of insulin lipid oxidation oxidation of glucose

Question # 30. Chromatin

The chemical basis of chromatin are molecules:

Select correct answers

- ribonucleic acids' starch's cholesterol hormones' deoxyribonucleic acids'
- polypeptides

Question # 31. Mendel's laws

Law of independent assortment formulated by Mendel is valid for :

Select correct answers

- diploid organisms whose homologous chromosomes are not separated in the anaphase of the first division of meiosis

- diploid organisms whose gametes are randomly combined in fertilization
- diploid organisms whose genes are in different pairs of homologous chromosomes
- haploid organisms whose genes are in different pairs of homologous chromosomes
- diploid organisms whose genes are in the same pair of homologous chromosomes
- diploid organisms whose chromosomes are randomly combined in meiosis

Question # 32. Chordates

What are the common features of the organization of Chordates you can specify:

Select correct answers

- heart is on the dorsal side pharyngeal slits or clefts in early embryogenesis
- mouthpart is formed by modified legs circulatory system is open
- neural tube with neurocoel internal axial skeleton

Question # 33. Agroecosystems

What are the similarities of the ecosystems and agroecosystems:

Select correct answers

- the presence of producers, consumers, decomposers
- using solar energy use of additional energy sources small number of species
- biogeochemical cycles not closed closed of biogeochemical cycles

Question # 34. Axial complex

What organs belong to the axial complex of Chordates:

Select correct answers

- gut notochord neural tube spinal column brain heart

Question # 35. Ferns

Specify the general characteristics of ferns:

Select correct answers

- gametophyte has real roots, stems and leaves alternation of generations in which the sporophyte is dominant alternation of generations in which the haploid generation dominates
- sporophyte reduced to a small germ these are the first plants with conductive xylem and phloem tissues the sporophyte has true roots, stems, leaves, and conducting tissue

Question # 36. Evolution

In an ideal population:

Select correct answers

- allele frequencies change over generations large number of individuals there is a selection for this allele equal phenotype survival no change in allele frequencies in generations
- crosses are not random

Question # 37. Heart muscle

Human heart muscle is characterized by:

Select correct answers

- lack of nuclei in cells presence of striated muscle tissue contractions as a result of nerve impulses of spinal cord motor neurons numerous connections between cells spontaneous rhythmic contractions presence of smooth muscle tissue

Question # 38. Endoderm

What are the derivatives of the endoderm:

Select correct answers

- dermis of the skin epithelium of the liver epithelium of the lungs epithelium of the abdominal cavity epithelium of the pancreas musculature of the uterus

Question # 39. Interaction of allelic genes

Specify the types of interaction of allelic genes:

Select correct answers

- complementarity domination codominance epistasis polymeria incomplete dominance

Question # 40. Birds

In birds, as in reptiles: Select correct answers

- four-chamber heart keratinization of the skin arterial blood does not mix with venous
 missing teeth skin dry, devoid of glands intestines, ureters, sex glands open into the cloaca

Question # 41. Primary succession

Set the sequence of primary succession processes of ecosystems

For correct answer set order

- formation of climax woodland 1,2,3,4,5,6
providing habitats for insects and other animals 1,2,3,4,5,6,
appearance of shrubs and semi-shrubs or trees
appearance of the lichen, algae, and fungi on the rocks 1,2,3,4,5,6
colonization of the territory with mosses and bushy lichens 1,2,3,4,5,6
forming an herbal community

Question # 42. Aromorphoses

Set the sequence for appearance of aromorphoses (general complications of the organization) in the evolution

For correct answer set order

- Two-chamber heart 1,2,3,4,5,6
two circles of blood circulation 1,2,3,4,5,6
development of the embryo in the uterus 1,2,3,4,5,6
horny scales cover the body 1,2,3,4,5,6
feeding the young with milk 1,2,3,4,5,6
lung respiration 1,2,3,4,5,6

Question # 43. Gene expression

Set the sequence of gene expression process:

For correct answer set order

- Proteins determine the characteristics of cells, forming protein structures or controlling metabolic processes 1,2,3,4,5,6
Removal of introns and splicing of exons 1,2,3,4,5,6
Transcription of DNA 1,2,3,4,5,6
Formation of a polypeptide with a specific amino acid sequence 1,2,3,4,5,5,6
Polypeptides form three-dimensional structures of functionally active protein molecules 1,2,3,4,5,6
Translation of mRNA in ribosome

Question # 44. Blood circulation

Specify the sequence of blood flow in a large circle of human blood circulation

For correct answer set order

right atrium 1,2,3,4.. venae cavae 1,2,3,4...veins of organs
1,2,3,4.....aorta. 1,2,3.....

arteries of organs 1,2,3,4.... left ventricle 1,2,3.....capillaries of organs: 1,2,3....

Question # 45. Moss plants

Set the sequence of development of haploid moss plants

For correct answer set order

from the zygote sporophyte is formed 1,2,3,4.....

haploid spore produces a protonema (mass of thread-like filaments) 1,2,3,4.....

spore-producing cells undergo meiosis to form haploid spores 1,2,3,4.....

adult plant structurally differentiated into stems and leaves 1,2,3,4.....

in the gametophyte develop the anteridia and archegonia 1,2,3,4....

in the presence of water the fertilization occurs

Question # 46. Class Arachnida

Specify the characteristics of the class Arachnida and class Insecta:

development is direct or with metamorphosis

- class Arachnida class Insecta three pairs of legs class Arachnida
- class Insecta body consists of the the head, thorax, and abdomen
- class Arachnida class Insecta body consists of the cephalothorax and abdomen
- class Arachnida class Insecta mouthparts is formed by the upper and lower jaws
- class Arachnida class Insecta presence of chelicerae and pedipalps
- class Arachnida class Insecta four pairs of legs class Arachnida class Insecta development

with complete and incomplete metamorphosis class Arachnida class Insecta

Question # 47. Alleles

Establish the correspondence between the location of alleles in chromosomes and the type of organism: in homologous autosomes are different alleles of the gene

- gemizygote homozygote heterozygote in both X-chromosomes of the female are the same alleles of the gene gemizygote homozygote heterozygote allele of the gene is in the non-homologous area of the X chromosome of the male gemizygote homozygote heterozygote homologous autosomes contain the same alleles of a given gene

gemizygote homozygote heterozygote in both X-chromosomes of the female different alleles of the gene

gemizygote homozygote heterozygote Question # 48. Sperm and eggs: Correlate the characteristics of sperm and eggs:small mobile cells, the volume of cytoplasm is insignificant

- eggs sperms haploid nucleus eggs sperms large immobile cell with a stock of substances necessary for development eggs sperms presence of the flagellum eggs sperms presence of special protective shells

eggs sperms presence of acrosome eggs sperms

Question # 49. Higher and lower plants

Specify the characteristics of higher and lower plants:

body of plants is not differentiated into tissues and organs lower plants higher
plant reproductive organs have a multicellular structure lower plants higher plant
sdominant phase of the life cycle is the sporophyte lower plants higher plant
body of plants is differentiated into organs and tissues lower plants higher plant
reproductive organs single-celled lower plants higher plant
multicellular embryo lower plants higher plant
dominant phase of the life cycle is the gametophyte lower plants higher plant

Question # 50. Natural selection

Establish the correspondence between the main forms of natural selection and the results of their action on individuals in the population:

acts to hold a trait at a constant optimum, and in the simplest case all deviations from this optimum are selectively disadvantageous

stabilizing form of selection disruptive natural selection directional natural selection
describes changes in population in which extreme values for a trait are favored over intermediate values. In this case, the variance of the trait increases and the population is divided into two distinct groups
 stabilizing form of selection disruptive natural selection directional natural selection
under this tape of selection an extreme phenotype is favored over other phenotypes; the advantageous allele increases as a consequence of differences in survival and reproduction among different phenotypes
 stabilizing form of selection disruptive natural selection directional natural selection