

BIOLOGY SAMPLE QUESTIONS

I. In addition to the phosphate group, nucleotide composition of DNA includes:

1. Ribose and nitrogen bases: adenine, guanine, thymine, cytosine
2. Ribose and nitrogen bases: adenine, uracil, thymine, guanine
3. deoxyribose and nitrogen bases: thymine, guanine, cytosine, adenine
4. deoxyribose and nitrogen bases: uracil, guanine, cytosine, adenine

II. The composition of the cell wall of Gram positive bacteria include:

1. peptidoglycans
2. cellulose
3. pectins
4. none of the above

III. Which of the following is NOT true for the prophase of mitosis?

1. The nuclear membrane dissolves
2. Chromosomes consist of two chromatids
3. Chromosomes consist of one chromatid
4. In the area of centromere, the presence of kinetochore is noticed

IV. The decomposition of substances originating from the cells through the process of autophagy takes place in:

1. Primary lysozyme
2. Golgi apparatus
3. Endosome
4. Secondary lysozyme

V. During the lysogenic life cycle of the bacteriophage:

1. Phage DNA integrates with bacterial DNA.
2. Phage DNA is doubled together with bacterial DNA.
3. Certain external signals can trigger a lytic cycle in infected bacteria.
4. All of the above is true.

VI. Separation of the sister chromatids of each chromosome takes place in:

1. metaphase of mitosis
2. anaphase of meiosis I
3. anaphase of meiosis II
4. telophase of meiosis II

VII. Which of the following is true?

1. From one spermatogonia, two functional mature spermatozoa become in the process of spermatogenesis.
2. The process of oogenesis in most mammal species begins in puberty and lasts until the end of a female's life.
3. In the process of oogenesis, only one functional egg cell is produced.
4. The process of spermatogenesis is not continuous, but has two delays.

VIII. What is true?

1. Cortical reaction involves ejection of cortical granules content into the vitelline envelope of the egg cell.
2. Accrosomal reaction is the joining of haploid nuclei, i.e. the genetic material of the egg cell and spermatozoa.
3. Fertilizing layer facilitates the penetration of sperm into the egg.
4. All of the above.

IX. During neurulation:

1. formation of the endoderm begins
2. there is a replacement of the notochord by the backbone
3. neural tube is formed
4. a primitive streak is formed

X. Human placenta consists of:

1. yolk sac and allantois
2. chorion, amnion and allantois
3. chorion and yolk sac
4. chorion, allantois and uterine tissue

XI. Information molecules of human development are:

1. mRNA molecules found in the cytoplasm of the egg cell
2. mRNA molecules that are part of the vitelline envelope
3. mRNA molecules that synthesize follicular cells
4. mRNA molecules found in the cytoplasm of spermatozoa

XII. Which of the following reactions is the result of parasympathetic stimulation?

1. reduced discharge of the bladder
2. enhanced food digestion
3. narrowing the blood vessels of the skin
4. decreased salivation

XIII. Sweet taste receptors are located:

1. on the whole surface of the tongue
2. at the top of the tongue
3. at the overside of the tongue
4. at the bottom of the tongue

XIV. When the monocytes from the circulation enter the tissues, they are converted into:

1. macrophages
2. T lymphocytes
3. "natural killer" cells
4. none of the above

XV. Center regulating the heartbeat is located in:

1. cerebellum (little brain)
2. diencephalon (interbrain)
3. mesencephalon (midbrain)
4. medulla oblongata

XVI. How many molars there are in each human jaw?

1. 6
2. 8
3. 10
4. 12

XVII. When reducing the amount of sodium in the blood, its return from the urine back into the blood is influenced by:

1. vasopressin
2. aldosterone
3. parathormon
4. oxytocin

XVIII. Testis NO creates:

1. oestrogens
2. progestins
3. cortisol
4. androgen

XIX. Which of the following statements about the DNA molecule is correct?

1. The basic principle on which its secondary structure is based is the complementarity between the nitrogen bases.
2. Complementary nitrogen bases are A and T, and C and G respectively.
3. The sequence of nucleotides in one chain is always determined by the order of the nucleotide in the other.
4. All of the above.

XX. What is true from the following?

1. Chromosomes in their characteristic form are recognizable in the eukaryotic cell only during the interphase (between two cell divisions).
2. During cell division, the chromosomal material - chromatin - is spread through the nucleus as a diffuse matter.
3. In the nucleus of the eukaryotic cell, DNA is a double coil that is not associated with proteins.
4. In the eukaryotic cell, the total length of the two-stranded DNA multiple times exceeds the diameter of the cell.

XXI. AUG codon is:

1. stop-signal in translation
2. codon for amino acid methionine and at the same time a start codon
3. codon for amino acid tryptophan
4. none of the above

XXII. When proteins are classified according to the roles they perform, the largest class consists of:

1. contractile proteins
2. structural proteins
3. enzymes
4. immunoglobulins

XXIII. Which of the following is WRONG?

1. Fertilized egg cell has the ability to form all types of cells of one organism.
2. Similar groups of genes, with a similar order on chromosomes, are involved in controlling the development of worms, insects and vertebrates.
3. In birds and butterflies, females have different sex chromosomes, and males have the same.
4. Chromosome Y is significantly bigger than X chromosome.

XXIV. Sickle cell disease is caused by:

1. gene mutation
2. polyploidy
3. trisomy of autosomes
4. monosomy of autosomes

XXV. The karyotype of a person with Turner syndrome is:

1. 45, X0
2. 47, XXX
3. 47, XXY
4. 47, XYY

XXVI. Which of the following is WRONG?

1. Chromosome deletions usually have harmful effects, which can be lethal.
2. Chromosome duplication is thought to have an important and positive role in evolution.
3. Moving a part of one chromosome to another chromosome is called inversion.
4. Some plant and animal species normally possess different types of translocation and inversion in their populations.

XXVII. What's true of that?

1. Suffering from albinism are homozygous and heterozygous for the mutation.
2. Huntington's disease is inherited autosomal dominantly.
3. The haemophilia-causing gene is on chromosome Y.
4. All of the above.

XXVIII. If the population is in the genetic balance and consists of 1000 people of which 640 have the genotype "AA", then the frequency of the allele "A" is:

1. 0.8
2. 0.2
3. 0.64
4. 0.32

XXIX. ABO blood group system is controlled by:

1. Three different genes that have one allele each.
2. One gene that has three alleles.
3. Two different pleiotropic genes.
4. A large number of genes.

XXX. How many genotypes will be obtained in the F₂ generation in monohybrid crossing?

1. 1
2. 2
3. 3
4. 4