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Biology test has 30 questions on 4 pages. In each question, only one answer is correct. Each correct answer scores 1 point. There are no negative points.

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1. Collenchyma is:
  - 1) photosynthetic parenchyma
  - 2) lateral meristem
  - 3) mechanical tissue
  - 4) conductive tissue
  
2. Which of the following statements is incorrect:
  - 1) Sporophyte is dominant in mosses.
  - 2) Gymnosperms are exclusively woody plants.
  - 3) Ferns reproduce asexually by spores.
  - 4) The perianth consists of a calyx and a corolla.
  
3. Representatives of the Bean family are distinguished by:
  - 1) the capsella fruit and symbiosis with fungi
  - 2) an actinomorphic flower and the pod fruit
  - 3) symbiosis with nitrogen-fixing bacteria
  - 4) inflorescence - head and fruit - achene
  
4. The Secondary root growth is provided by
  - 1) parenchyma cells with starch
  - 2) cambium and phelogen
  - 3) secondary xylem and phloem
  - 4) apical meristems
  
5. Agar is obtained from:
  - 1) green algae
  - 2) brown algae
  - 3) red algae
  - 4) silicate algae
  
6. The size of the viruses is expressed in:
  - 1) micrometres
  - 2) nanometres
  - 3) millimetres
  - 4) centimetres
  
7. Which of the following the bacteria do not have?
  - 1) fimbriae
  - 2) pili
  - 3) flagella
  - 4) cilia

8. The composition of nucleotides that form RNA includes:
  - 1) phosphate group, deoxyribose, adenine
  - 2) phosphate group, ribose, uracil
  - 3) phosphate group, ribose, thymine
  - 4) phosphate group, deoxyribose, cytosine
  
9. Pentoses are:
  - 1) monosaccharides
  - 2) disaccharides
  - 3) oligosaccharides
  - 4) polysaccharides
  
10. Polypeptides:
  - 1) are nucleotide polymers having an amino group at one end and a carboxyl group at the other
  - 2) are amino acid polymers
  - 3) are synthesized in the smooth endoplasmic reticulum
  - 4) serve as a matrix for protein synthesis
  
11. Mitochondria:
  - 1) contain stroma thylakoids and granum thylakoids
  - 2) they have their own DNA molecules and their own ribosomes
  - 3) the outer membrane has a larger surface area than the inner
  - 4) have the ability to synthesize ATP in the process of photosynthesis
  
12. Based on the number of cellular extensions, neurons can be:
  - 1) bipolar
  - 2) multipolar
  - 3) unipolar
  - 4) all answers are correct
  
13. Parts of the brain stem are:
  - 1) medulla oblongata, the pons and midbrain
  - 2) medulla oblongata, cerebellum and the pons
  - 3) midbrain, spinal cord and medulla oblongata
  - 4) midbrain, spinal cord and the pons
  
14. Speech is controlled by:
  - 1) midbrain
  - 2) cerebellum
  - 3) cerebrum
  - 4) medulla oblongata
  
15. Under the influence of the hormones from the posterior pituitary is:
  - 1) maturation of sperm and eggs
  - 2) reduction of calcium ion concentration
  - 3) water retention in the body
  - 4) increase in thyroid hormone levels

16. The product of renal secretion that participates in the regulation of blood pressure is:
- 1) cortisol
  - 2) antidiuretic hormone
  - 3) aldosterone
  - 4) renin
17. When it comes to the formation of axial organs during the process of gastrulation, the notochord is formed from:
- 1) ectoderm
  - 2) endoderm
  - 3) mesoderm
  - 4) cartilage
18. At each replication of linear DNA molecules, there is a shortening of:
- 1) nucleosomes
  - 2) centromeres
  - 3) telomeres
  - 4) microtubules
19. During one minute, a person performs an average of 12 breathing cycles (inhale, exhale and pause). If it is found at an altitude of over 3000 m, it will breathe:
- 1) slower
  - 2) faster
  - 3) there will be no change in respiratory rate
  - 4) the speed will change only if the outside temperature is below 0 ° C
20. Hormones, regulators of pancreatic juice secretion are:
- 1) trypsinogen and chymotrypsinogen
  - 2) secretin and cholecystokinin
  - 3) gastrin and pepsin
  - 4) ghrelin and insulin
21. The structure of hemoglobin protein is:
- 1) primary
  - 2) secondary
  - 3) tertiary
  - 4) quaternary
22. Which of the following enzymes has the role of breaking hydrogen bonds between complementary bases in the DNA molecule, in the process of replication:
- 1) DNA polymerase
  - 2) helicase
  - 3) ligase
  - 4) topoisomerase
23. Atrioventricular (AV) node:
- 1) is located in the wall of the left atrium
  - 2) slows down the heart rate
  - 3) speeds up the heart rate
  - 4) has no effect on the heart rate

24. If the cell in the metaphase of mitosis contains 24 chromosomes then:
- 1) in the G<sub>1</sub> phase of the interphase the cell contains 12 DNA molecules
  - 2) in the G<sub>2</sub> phase of the interphase the cell contains 24 DNA molecules
  - 3) in the prometaphase of mitosis the cell contains 48 DNA molecules
  - 4) all answers are correct
25. In a population that is in equilibrium and contains 6000 individuals, a gene having two gene alleles (A) and (a), determines the following genotypes: (AA), (Aa) and (aa). In the case the population contains 3400 individuals with genotype (AA), 2200 individuals with genotype (Aa) and 400 individuals with genotype (aa), determine the frequency of allele (a) in that population using the Hardy Weinberg principle.
- The answer:
- 1) 25%
  - 2) 50%
  - 3) 75%
  - 4) 90%
26. Animals that can maintain their body temperature within narrow limits are called:
- 1) ectothermic
  - 2) heterothermal
  - 3) endothermic
  - 4) poikilothermic
27. Sodium potassium pump allows that:
- 1) Na<sup>+</sup> ions are transported out of the cell
  - 2) K<sup>+</sup> ions are transported out of the cell
  - 3) Na<sup>+</sup> ions are transported into the cell
  - 4) Mg<sup>+</sup> ions are transported into the cell
28. Determine which of the following is the consequence of a changes in chromosome number:
- 1) deletions
  - 2) translocations
  - 3) aneuploidy
  - 4) inversions
29. The transcribed nucleotide sequence in the DNA segment is: TAG-AGT-CCC-GAC-ACG. Which of the following will be the nucleotide sequence in the corresponding mRNA transcript?
- 1) ATC-TCA-GGG-GAG-TGC
  - 2) AUC-UCA-GGG-CUG-UGC
  - 3) UTC-TCU-GGG-GTG-TGC
  - 4) ATC-TCA-GGG-CUG-TCG
30. In the case where the mothers blood group is A (I<sup>A</sup>I<sup>O</sup>) and the fathers blood group is B (I<sup>B</sup>I<sup>O</sup>), determine the possible phenotypes of the offspring. This couple can have:
- 1) daughter with blood group AB
  - 2) daughter with blood group A and son with blood group B
  - 3) son with blood group A, and a daughter with blood groups O and AB
  - 4) all answers are correct