

**Sarajevo School of Science and Technology**  
Sarajevo, April 2014

**Entrance Exam**

**BIOLOGY (30 questions, 90 minutes)**

Name: \_\_\_\_\_

*Questions 1-22, circle the correct answer.*

1. The first evolutionary molecule that can be both enzyme and substrate can store genetic information as well as cause the chemical reactions necessary to copy itself is:

- A. Protein
- B. DNA
- C. Peptide
- D. RNA

2. Beta sheet (also  $\beta$ -pleated sheet) is one form of protein:

- A. Primary structure
- B. Secondary structure
- C. Tertiary structure
- D. Quaternary structure

3. In both prokaryotic and eukaryotic cells we find:

- A. Mitochondria
- B. Centriole
- C. Nucleus
- D. Ribosomes

4. Trachea is an organ for:

- A. Digestion
- B. Secretion
- C. Respiration
- D. Transduction

5. Dendrites are the branched projections of a neuron that propagate the electrochemical stimulation:

- A. To the neuron cell body (soma)
- B. From the neuron cell body (soma)
- C. To the responding organ
- D. None of the above

6. In eukaryotic cells, protein synthesis takes place at the:

- A. Nucleus
- B. Mitochondria
- C. Chloroplasts
- D. Ribosomes
- E. Lysosome

7. Deforestation will decrease:

- A. Soil erosion
- B. Land slides
- C. Soil fertility
- D. Rainfall

8. What stage in the meiosis do the paired homologous chromosomes line up along the equatorial plate?

- A. Telophase
- B. Anaphase
- C. Metaphase
- D. Prophase

9. Most plants are not suitable for human consumption. This is because we do not possess the ability to digest them properly. Why is this so?

- A. Plants have an anti-digestion substance in them.
- B. We cannot chew them properly.
- C. They have a high concentration of cellulose.
- D. They are poisonous.

10. In which of the following habitats does the diurnal temperature of soil surface vary most?

- A. Shrub land
- B. Forrest
- C. Desert
- D. Grassland

11. Parkinson's disease is the disease of:

- A. Heart
- B. Lungs
- C. Brain
- D. Kidneys

12. The four bases which form the code words for DNA are:

- A. UTAC
- B. ACTU
- C. AGCU
- D. ATCG

13. The two components of an ecosystem are:

- A. Plants and animals
- B. Trees and humans
- C. Energy flow and mineral cycling
- D. Biotic and abiotic

14. Protein found in human hair is:

- A. Glutellin
- B. Aleurone
- C. Keratin
- D. Globulin

15. A person with unknown blood group under ABO system has suffered much blood loss in an accident and needs immediate blood transfusion. His friend who has a valid certificate of his own blood type offers for blood donation without delay. What would have been the type of blood of the donor friend?

- A. Type A
- B. Type B
- C. Type AB
- D. Type O

16. Expressed phenotype in a hybrid is called:

- A. Dominant
- B. Recessive
- C. Co-dominant
- D. Epistatic

17. Liver cirrhosis is caused by the chronic consumption of:

- A. Tobacco
- B. Alcohol
- C. Fats
- D. Drugs

18. A tumour that does not spread is termed:

- A. Malignant
- B. Metastasized
- C. Benign
- D. Basophils

19. A health disorder that results from a deficiency of thyroid hormone production in adults and is characterized by a low metabolic rate, increase in body weight and tiredness is:

- A. Hyperthyroidism
- B. Goiter
- C. Cretinism
- D. Hypothyroidism

20. The best source of renewable energy is/are:

- A. Cattle
- B. Petroleum
- C. Coal
- D. Trees

21. Which of the following organisms is NOT classified as a Protist?

- A. Chlamydia
- B. Amoeba
- C. Paramecium
- D. Green alga
- E. Slime mold

22. In vertebrate organisms, oxygen and carbon dioxide are transported throughout the body by binding to the:

- A. Water molecules in the blood
- B. Hemoglobin in white blood cells
- C. Hemoglobin in red blood cells
- D. Lymph in white blood cells

E. Lymph in red blood cells

23-30. **Match expressions 23-30 with their counterparts a - k (NOTE: there can be more than one counterpart per expression):**

- a) Processing of proteins for secretion
- b) Unpackages an organism's genes
- c) Krebs cycle
- d) Anticodon
- e) Short and newly synthesized DNA fragments
- f) RER and SER
- g) Small and non-coding RNA
- h) First step of gene expression
- i) ATP production
- j) Cisternae
- k) Role in metabolism and detoxification
- l) Protein synthesis

23. Mitochondrion \_\_\_\_\_

24. Transcription \_\_\_\_\_

25. tRNA \_\_\_\_\_

26. Golgi apparatus \_\_\_\_\_

27. Endoplasmic reticulum \_\_\_\_\_

28. Helicase \_\_\_\_\_

29. Okazaki fragments \_\_\_\_\_

30. miRNA \_\_\_\_\_