Sarajevo School of Science and Technology
[redacted]

Entrance Exam

BIOLOGY (30 questions, 90 minutes)

Name: _____

Questions 1-22, circle the correct answer.

1. In eukaryotic cells, breaking down of biomolecules takes place at/in the:

A. Nucleus
B. Mitochondria
C. Chloroplasts
D. Ribosomes
E. Lysosomes

2. The ability of a single cell to divide and produce all of the differentiated cells in an organism is referred to as:

A. Cell fate
B. Pattern formation
C. Polarity
D. Totipotency
E. Determination

3. The evolutionary history of a species, or groups of related species, is referred to as:

A. Phylogeny
B. Speciation
C. The fossil record
D. Paleontology
E. Pedigree Analysis

4. This makes up about 50-55% of blood and is yellowish in color.

A. Leukocytes
B. Platelets
C. White blood cells
D. Plasma

5. Organic compounds are characterized from inorganic compounds by the:

A. Presence of water
B. Presence of carbon
C. Absence of salt
D. Absence of oxygen

6. DNA strand of 1200 nucleotides length codes for a protein containing:

A. 400 amino acids
B. 600 amino acids
C. 300 amino acids
D. 200 amino acids

7. Fission, budding and sporulation are examples of:

A. Responses to a stimuli
B. Digestion processes
C. Mineral transport
D. Asexual reproduction

8. Which of the following **DO NOT** describe the organisms under Kingdom Monera?

A. The absence of a nuclear membrane.
B. Aerobic
C. Microscopic
D. Made up of prokaryotes.

9. The thickening of chromosomes making it more visible happens on which stage mitosis?

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

10. In which organ is Peristalsis **NOT** happening?

A. Small Intestines
B. Large Intestines
C. Esophagus
D. Heart

11. The inner lining of the digestive tract is made up of what type of tissues?

A. Muscular
B. Nervous
C. Epithelial
D. Connective

12. Genes carry the hereditary information from one offspring to another. What organic compound in genes is specifically designed for this task?

A. Proteins
B. Enzymes
C. Lipids
D. Nucleic acids

13. The segments of DNA, capable of moving from one location to another are:

A. Introns
B. Transposons
C. Exons
D. Operons

14. What base occurs in RNA instead of the nitrogenous base thymine found in DNA:

A. Uracil
B. Cytosine
C. Guanine
D. Ribose

15. During transcription RNA polymerase has a role in:

A. Termination
B. Elongation
C. Initiation
D. All of the above

16. If the total amount of adenine and thymine in a double-stranded DNA is 45%, the amount of guanine in this DNA will be:

A. 22.5%
B. 27.5%
C. 45%
D. 55%

17. The sequences of cell cycle is:

A. S, M, G1, G2
B. G1, G2, S, M
C. M, G1, G2, S
D. G1, S, G2, M

18. Which of the following enzymes is used to covalently bond foreign DNA to a vector plasmid?

A. DNA polymerase
B. Restriction endonuclease
C. DNA ligase
D. DNA helicase

19. All of the following are used in PCR except:

A. Taq Polymerase
B. Restriction enzyme
C. Oligonucleotide primers
D. DNA
E. cDNA

20. Ozone hole is greatest over:

A. India
B. Europe
C. Antartica
D. Africa

21. The most common indicator organism that represents polluted water is:

A. E. coli
B. P. typhii
C. C.vibrio
D. Entamoeba

22. The reflex arc is formed by:

A. Brain - spinal cord - muscles
B. Receptor - spinal cord - muscles
C. Muscles - receptor - brain
D. Muscles - spinal cord - receptors

23-30. ***Match expressions 23-30 with its counterparts a - k (NOTE: There can be more then one per expression):***

a) Gene expression regulation at the post-transcriptional level,
b) Part of the gene expression process,
c) Ligand,
d) Photosynthesis,
e) Site of transcription,
f) Absorbs light,
g) Semiconservative DNA replication,
h) Proceeds in 4 phases,
i) Cellular response to stimuli,
j) DNA synthesis,
k) Centromere,
l) Alterations in the transcriptional potential that are not necessarily heritable.

23. Nucleus_____

24. Translation_____

25. Chromosomes_____

26. Receptor _____

27. Epigenetics _____

28. Chlorophyll_____

29. DNA polymerase_____

30. miRNA_____