

Markhor Junior Contest ®

Aspirant Level (Class IX, X, O/A Level) Science 2018

There are 25 questions, and each question carries two marks.

- 1. Which statistical test is most suitable to compare the mean reaction times of two independent groups?**
A) Chi-square test
B) Student's t-test
C) ANOVA
D) Spearman's rank correlation
- 2. Which of the following is a product of the Calvin cycle?**
A) Oxygen
B) ATP
C) NADPH
D) Glucose ($C_6H_{12}O_6$)
- 3. Which enzyme adds complementary nucleotides during DNA replication?**
A) DNA ligase
B) DNA polymerase
C) RNA polymerase
D) Primase
- 4. The role of the promoter region in gene expression is to:**
A) Terminate transcription
B) Bind RNA polymerase and initiate transcription
C) Carry codons for amino acids
D) Splice introns from RNA
- 5. In codominance, such as in human blood group AB, the alleles:**
A) Blend to form an intermediate phenotype
B) One completely masks the other
C) Both are fully expressed in the phenotype
D) Neither is expressed in the phenotype
- 6. DNA methylation generally leads to:**
A) Increased gene expression
B) Decreased gene expression
C) No effect on expression
D) Conversion of RNA into DNA
- 7. Histone acetylation typically leads to:**
A) Tighter chromatin packing, silencing genes
B) Looser chromatin packing, activating genes
C) DNA strand breaks
D) Translation of noncoding RNAs

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8. Which of the following is a therapeutic application of CRISPR?
- A) Creating herbicide-resistant crops
 - B) Correcting disease-causing mutations in human cells**
 - C) Cloning endangered species
 - D) Producing genetically modified bacteria for milk
9. Which technique allows rapid amplification of DNA for medical diagnostics, forensic analysis, or GMO detection?
- A) Southern blotting
 - B) PCR (Polymerase Chain Reaction)**
 - C) CRISPR-Cas9
 - D) Gel electrophoresis
10. The primary function of the nephron is:
- A) Secreting digestive enzymes
 - B) Filtering blood and forming urine**
 - C) Transporting oxygen
 - D) Conducting nerve impulses
11. Which cells are primarily responsible for cell-mediated immunity?
- A) B cells
 - B) Helper T cells (CD4+) and cytotoxic T cells (CD8+)**
 - C) Plasma cells
 - D) Neutrophils
12. Which of the following is not effective against viral infections?
- A) Vaccination
 - B) Antiviral drugs**
 - C) Antibiotics
 - D) Quarantine
13. Which part of the brain regulates homeostasis, hunger, and hormonal control?
- A) Cerebellum
 - B) Medulla oblongata
 - C) Hypothalamus**
 - D) Hippocampus
14. The evolution of antibiotic resistance in bacteria is an example of:
- A) Artificial selection
 - B) Natural selection**
 - C) Genetic drift
 - D) Speciation by hybridization
15. Which technique compares DNA or protein sequences to study evolutionary relationships?
- A) Fossil dating

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B) Comparative genomics

C) Radiocarbon dating

D) Gel electrophoresis of RNA only

16. The primary source of energy for most ecosystems is:

A) Decomposers

B) Sunlight

C) Fossil fuels

D) Nutrients in soil

17. Which human activity directly increases methane emissions, a potent greenhouse gas?

A) Deforestation

B) Landfills and livestock farming

C) Automobile exhaust

D) Solar panel installation

18. Which of the following protists is photosynthetic?

A) Plasmodium

B) Euglena

C) Giardia

D) Trypanosoma

19. MRSA (Methicillin-Resistant Staphylococcus aureus) is an example of:

A) Viral resistance

B) Antibiotic-resistant bacteria

C) Fungal infection

D) Protozoan infection

20. Which microbial group is primarily responsible for decomposition and nutrient cycling in ecosystems?

A) Bacteria and fungi

B) Viruses

C) Protozoa only

D) Helminths

21. Isotopes of an element differ in:

A) Number of protons

B) Number of neutrons

C) Number of electrons

D) Chemical behavior

22. Which trend increases across a period from left to right?

A) Atomic radius

B) Ionization energy

C) Metallic character

D) Atomic mass only

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23. The electrostatic attraction between positively charged ions and negatively charged ions forms:
- A) Covalent bonds
 - B) Ionic bonds**
 - C) Metallic bonds
 - D) Hydrogen bonds
24. Which molecule exhibits trigonal pyramidal geometry?
- A) NH₃**
 - B) BH₃
 - C) CO₂
 - D) CH₄
25. Biomimicry in engineering is defined as:
- A) Designing solutions inspired by natural forms, processes, and ecosystems**
 - B) Copying animal behavior for entertainment only
 - C) Using machines to replace humans completely
 - D) Ignoring nature in design