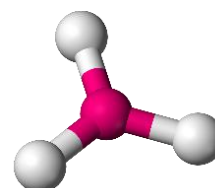


Markhor Junior Contest ®

Aspirant Level (Class IX, X, O/A Level) Science 2009

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

1. A peer reviewer finds that an experiment lacked a control group. What problem does this cause?
A) The independent variable cannot be identified
B) The effect of the independent variable cannot be distinguished from other factors
C) The dependent variable cannot be measured
D) The experiment has too much replication
2. An atom has 17 protons, 18 neutrons, and 17 electrons. Its mass number and charge are:
A) 35, neutral
B) 35, +1
C) 34, neutral
D) 35, -1
3. Which trend is opposite for metals and non-metals across a period?
A) Atomic radius decreases
B) Metallic character decreases
C) Electronegativity increases
D) Ionization energy increases
4. Hydrogen chloride in gas form has:
A) Ionic bonds
B) Polar covalent bonds
C) Metallic bonds
D) Network covalent bonds
5. Which molecule has a trigonal bipyramidal electron geometry but seesaw molecular shape?
A) SF_4
B) PCl_5
C) XeF_2
D) BF_3
6. Which structure is responsible for the breakdown of worn-out organelles?
A) Peroxisome
B) Lysosome
C) Golgi vesicle
D) Nucleolus



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7. In C₄ plants, the primary advantage of the Hatch-Slack pathway over the Calvin cycle alone is:
A) It avoids photorespiration by concentrating CO₂ in bundle-sheath cells.
B) It eliminates the need for ATP.
C) It replaces the electron transport chain.
D) It absorbs more light per unit area
8. A mutation changes the codon UAU (tyrosine) into UAA. What type of mutation is this?
A) Silent mutation
B) Missense mutation
C) **Nonsense mutation**
D) Frameshift mutation
9. Epigenetic regulation, such as DNA methylation, generally results in:
A) Increased transcription
B) **Decreased transcription by silencing genes**
C) Faster mRNA translation
D) Increased ribosome binding
10. Which inheritance pattern explains why human blood groups have four phenotypes (A, B, AB, O)?
A) Incomplete dominance
B) **Codominance and multiple alleles**
C) Polygenic inheritance
D) Epistasis
11. Which element increases transcription rates in eukaryotes by binding proteins at a distance from the promoter?
A) **Enhancer**
B) Operator
C) Terminator
D) Silencer
12. Imprinting disorders, such as Prader–Willi syndrome and Angelman syndrome, arise due to:
A) Errors in Mendelian dominance
B) **Epigenetic silencing of parental alleles**
C) Polygenic inheritance
D) Mutations in mitochondrial DNA
13. Golden Rice, a genetically modified crop, was engineered to:
A) Resist drought conditions
B) **Produce beta-carotene to combat vitamin A deficiency**
C) Increase sugar content
D) Resist herbicides

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14. Which of the following is a potential risk of GM crops?

- A) Development of resistance in pests
- B) Gene transfer to wild relatives
- C) Unintended allergenicity
- D) All of the above**

15. Which organ produces bile, essential for lipid digestion?

- A) Pancreas
- B) Gallbladder
- C) Liver**
- D) Stomach



16. Which immune cell type remembers previous infections and responds rapidly upon re-exposure?

- A) Plasma cells
- B) Memory B and T cells**
- C) Neutrophils
- D) Macrophages

17. Zoonotic diseases are:

- A) Diseases transmitted only by water
- B) Diseases transmitted from animals to humans**
- C) Non-infectious genetic diseases
- D) Exclusively viral diseases

18. The nodes of Ranvier in myelinated axons function to:

- A) Produce neurotransmitters
- B) Accelerate saltatory conduction of action potentials**
- C) Protect neurons from toxins
- D) Synthesize myelin

19. Which statement about speciation is correct?

- A) It always occurs quickly within one generation
- B) Reproductive isolation is a key step in the formation of new species**
- C) Speciation cannot occur in plants
- D) Allopatric speciation requires hybridization

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20. Which observation supports common ancestry?
- A) Convergent evolution of wings in bats and insects
 - B) Similar DNA sequences of conserved genes across species**
 - C) Random mutations in isolated populations
 - D) Absence of homologous structures
21. Which concept explains why species diversity tends to be higher near the equator?
- A) Latitude gradient in biodiversity**
 - B) Trophic cascade
 - C) Primary succession
 - D) Island biogeography
22. Plastic pollution primarily affects ecosystems by:
- A) Increasing soil fertility
 - B) Entering food chains and causing physical or chemical harm to organisms**
 - C) Reducing CO₂ emissions
 - D) Enhancing photosynthesis
23. Which structure allows amoebas to move and engulf food?
- A) Flagella
 - B) Cilia
 - C) Pseudopodia**
 - D) Hyphae
24. Which global initiative aims to combat antibiotic resistance?
- A) WHO's Global Action Plan on Antimicrobial Resistance**
 - B) Paris Agreement
 - C) Kyoto Protocol
 - D) CITES
25. The skin microbiome helps the host by:
- A) Producing toxins to harm the host
 - B) Competing with pathogenic microbes and modulating immune responses**
 - C) Destroying skin cells
 - D) Increasing UV penetration