

Markhor Junior Contest ®

Aspirant Level (Class IX, X, O/A Level) Science 2016

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

1. **Why is random sampling important in data collection?**
A) It ensures bias in favor of the hypothesis
B) It increases accuracy by representing the entire population
C) It avoids the need for replication
D) It makes experiments shorter
2. **The cis face of the Golgi apparatus is closest to which organelle?**
A) Plasma membrane
B) Rough endoplasmic reticulum
C) Lysosome
D) Mitochondrion
3. **Which of the following best explains the role of NADH and FADH₂ in respiration?**
A) They directly hydrolyze ATP.
B) They store high-energy electrons for the electron transport chain.
C) They act as enzymes for the Krebs cycle.
D) They provide oxygen for glycolysis.
4. **In transcription, which strand of DNA serves as the template?**
A) Coding strand
B) Non-coding strand
C) Both strands simultaneously
D) Either strand randomly
5. **Which regulatory protein binds to the operator region to block transcription in prokaryotes?**
A) Activator
B) Repressor
C) Enhancer
D) Promoter
6. **Which inheritance pattern results in continuous variation, such as human height or skin color?**
A) Monogenic inheritance
B) Codominance
C) Polygenic inheritance
D) Epistasis
7. **The trp operon in bacteria is usually active but can be turned off by:**
A) High lactose concentration
B) High tryptophan concentration

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- C) High glucose concentration
 - D) Low oxygen concentration
8. **The Dutch Hunger Winter (1944–45) is often cited as evidence for epigenetics because:**
- A) Starvation altered the DNA sequence of survivors
 - B) Malnutrition affected gene expression patterns in survivors' children**
 - C) Famine caused widespread genetic mutations
 - D) Food shortage reduced ribosome production
9. **Which of the following is a potential ethical concern regarding human gene editing using CRISPR?**
- A) Off-target mutations causing unintended effects
 - B) Germline modifications affecting future generations
 - C) Unequal access to technology
 - D) All of the above**
10. **Golden Rice is genetically engineered to:**
- A) Produce higher yields under poor soil
 - B) Contain beta-carotene to prevent vitamin A deficiency**
 - C) Resist fungal infections
 - D) Grow in saline water
11. **Which endocrine gland regulates metabolic rate through thyroxine secretion?**
- A) Pituitary
 - B) Thyroid**
 - C) Adrenal
 - D) Pancreas
12. **Which type of immunity is obtained naturally by infection and is usually long-lasting?**
- A) Passive immunity
 - B) Active immunity**
 - C) Innate immunity
 - D) Artificial immunity
13. **Which of the following infectious agents is unicellular and eukaryotic?**
- A) Virus
 - B) Bacterium
 - C) Protozoan**
 - D) Prion
14. **Which glial cell type produces myelin in the central nervous system?**
- A) Schwann cells
 - B) Oligodendrocytes**

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- C) Astrocytes
- D) Microglia

15. Allopatric speciation occurs when:

- A) Populations are geographically isolated**
- B) Species share the same habitat
- C) Mutations do not affect reproduction
- D) Natural selection is absent

16. Radiometric dating of fossils primarily relies on:

- A) Measuring fossil size**
- B) Measuring decay of radioactive isotopes in surrounding rocks**
- C) Counting layers of sediment alone
- D) Observing fossil color changes

17. Bioaccumulation refers to:

- A) Toxins concentrating in organisms over time**
- B) Energy loss in trophic levels
- C) Loss of species diversity
- D) Migration of keystone species

18. Which of the following is an example of biological pollution?

- A) Introduction of invasive species into a new habitat**
- B) Release of sulfur dioxide into the atmosphere
- C) Plastic waste in rivers
- D) Radioactive contamination

19. Gram-positive and Gram-negative bacteria differ primarily in:

- A) Shape of DNA
- B) Composition of their cell walls**
- C) Presence of cytoplasm
- D) Ribosome structure

20. Which strategy is most effective to reduce antibiotic resistance in communities?

- A) Limiting antibiotic prescriptions to necessary cases
- B) Completing prescribed antibiotic courses
- C) Public education on proper use
- D) All of the above**

21. Which factor most strongly influences microbial community composition in soil?

- A) Temperature, pH, moisture, and nutrient availability**
- B) Wind speed
- C) Altitude only
- D) Sunlight intensity

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22. Which statement is correct about ions?
- A) Cations have more electrons than protons
 - B) Anions have more electrons than protons**
 - C) All ions are neutral
 - D) Ions have equal numbers of protons and neutrons only
23. Which element has the highest electronegativity?
- A) Fluorine**
 - B) Sodium
 - C) Magnesium
 - D) Aluminum
24. Which statement is correct about ionic compounds?
- A) They conduct electricity in molten or aqueous state**
 - B) They are good conductors in solid state
 - C) They are malleable
 - D) They have low melting points
25. The shape of SF_4 is:
- A) See-saw**
 - B) Square planar
 - C) Tetrahedral
 - D) Trigonal bipyramidal