

Markhor Junior Contest ®

Aspirant Level (Class IX, X, O/A Level) Science 2011

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

- 1. Which is an example of systematic error?**
A) A balance always reads 0.2 g too high
B) A thermometer reading fluctuates randomly
C) A student mis records a result once
D) A sample is accidentally spilled
- 2. Which is the correct electron configuration for a neutral oxygen atom (atomic number 8)?**
A) $1s^2 2s^2 2p^4$
B) $1s^2 2s^2 2p^6$
C) $1s^2 2s^2 2p^2$
D) $1s^2 2s^2 2p^3$
- 3. Which of the following is anomalous in electron configuration due to extra stability of half-filled d orbitals?**
A) Chromium (Cr)
B) Calcium (Ca)
C) Oxygen (O)
D) Neon (Ne)
- 4. The bond in metallic lattices is responsible for:**
A) Electrical conductivity
B) Hardness
C) Low melting point
D) Molecular shape
- 5. Which molecule has a T-shaped geometry?**
A) ClF_3
B) SF_6
C) NH_3
D) CO_2
- 6. Which feature best explains why the nucleus is considered the “control center” of the cell?**
A) It synthesizes proteins directly.
B) It contains genetic information and regulates gene expression.
C) It provides ATP for energy.
D) It digests and recycles cellular waste.

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7. Which best explains the relationship between photosynthesis and respiration?
- A) Photosynthesis releases energy, respiration stores it.
 - B) Photosynthesis stores energy in glucose, respiration releases it.)**
 - C) Both processes consume oxygen and release carbon dioxide.
 - D) Both processes occur only in chloroplasts.
8. Which of the following is the correct start codon for translation in most organisms?
- A) UAA
 - B) AUG
 - C) UAG
 - D) UGA
9. Which best describes the difference between inducible and repressible operons?
- A) Inducible operons are normally off but can be turned on; repressible operons are normally on but can be turned off.**
 - B) Inducible operons are active in eukaryotes; repressible operons are active in prokaryotes.
 - C) Inducible operons produce enzymes constantly; repressible operons produce enzymes rarely.
 - D) Inducible operons affect transcription; repressible operons affect translation.
10. A heterozygous tall pea plant (Tt) is self-crossed. What percentage of offspring are expected to be homozygous tall?
- A) 25%**
 - B) 50%
 - C) 75%
 - D) 0%
11. In the absence of glucose, high levels of cAMP in E. coli enhance transcription of the lac operon by binding to:
- A) Repressor
 - B) Operator
 - C) CAP (catabolite activator protein)**
 - D) Promoter
12. Which enzyme family is responsible for removing acetyl groups from histones, leading to gene silencing?
- A) DNA methyltransferases
 - B) Histone deacetylases (HDACs)**
 - C) RNA polymerases
 - D) Helicases

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13. Which statement about gene therapy is correct?
- A) It always involves cloning entire organisms
 - B) It introduces functional genes into patient cells to treat disease**
 - C) It uses CRISPR exclusively in plants
 - D) It permanently deletes all chromosomes
14. Which method is commonly used to confirm the presence of a transgene in genetically modified plants?
- A) CRISPR-Cas9 editing
 - B) PCR amplification and gel electrophoresis**
 - C) RNA interference
 - D) Southern blotting exclusively
15. The primary function of platelets in the circulatory system is:
- A) Transport oxygen
 - B) Initiate blood clotting**
 - C) Destroy pathogens
 - D) Carry nutrients
16. In a secondary immune response, compared to the primary response, antibodies are:
- A) Produced more slowly and in smaller quantities
 - B) Produced faster and in greater quantities**
 - C) Produced at the same rate
 - D) Only IgM is produced
17. Which treatment is appropriate for bacterial infections but not viral infections?
- A) Antibiotics**
 - B) Antivirals
 - C) Supportive care
 - D) Vaccines



18. In a neural network, plasticity refers to:
- A) The speed of an action potential
 - B) The ability of neurons to strengthen or weaken synapses in response to activity**
 - C) The rigidity of axons
 - D) The number of neurotransmitters stored

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19. Convergent evolution occurs when:

- A) Distantly related species evolve similar traits due to similar environmental pressures**
- B) Closely related species evolve differently
- C) Mutations accumulate without selection
- D) Gene flow prevents adaptation

20. Which statement is correct regarding orthologous genes?

- A) Genes in different species that evolved from a common ancestral gene**
- B) Genes in the same species performing different functions
- C) Genes duplicated within a genome
- D) Genes that never mutate

21. Ex situ conservation includes:

- A) National parks
- B) Zoos, seed banks, and botanical gardens**
- C) Protecting rivers and forests
- D) Ecotourism initiatives

22. Greenhouse effect is:

- A) The trapping of heat in Earth's atmosphere by greenhouse gases**
- B) The reflection of sunlight by clouds
- C) A cooling process in polar regions
- D) The depletion of stratospheric ozone

23. Yeasts are used in industry primarily for:

- A) Nitrogen fixation
- B) Fermentation to produce alcohol and CO₂**
- C) Antibiotic production
- D) Bioremediation

24. Which factor accelerates the spread of resistance genes in bacterial populations?

- A) High bacterial density and horizontal gene transfer**
- B) Proper sanitation
- C) Vaccination
- D) Low mutation rates

25. Which process allows microbes to acquire genes from the environment, influencing microbial ecology?

- A) Transduction, transformation, and conjugation**
- B) Binary fission only
- C) Mitosis
- D) Spore formation