

Markhor Junior Contest ®

Aspirant Level (Class IX, X, O/A Level) Science 2015

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

1. A researcher measures enzyme activity at different pH values. Which element strengthens reliability?
A) Using different enzymes each time
B) Repeating the experiment multiple times and averaging results
C) Changing substrate concentration for each trial
D) Recording only the highest value observed
2. A scientist observes a double-membrane organelle with its own DNA, cristae, and enzymes for respiration. What organelle is this?
A) Chloroplast
B) Lysosome
C) Mitochondrion
D) Nucleolus
3. In photosynthesis, which pigment absorbs light most efficiently at wavelengths around 680 nm?
A) Chlorophyll a in Photosystem I (P700)
B) Chlorophyll a in Photosystem II (P680)
C) Carotenoids
D) Chlorophyll b
4. During transcription in eukaryotes, which type of RNA carries the genetic code from DNA to ribosomes?
A) rRNA
B) tRNA
C) mRNA
D) snRNA
5. In eukaryotes, transcription factors regulate gene expression by:
A) Modifying codons in mRNA
B) Assisting RNA polymerase binding to promoters or enhancers
C) Degrading tRNA molecules
D) Removing ribosomes from mRNA
6. In humans, albinism is caused by a recessive allele (a). Two carriers ($Aa \times Aa$) have a child. What is the probability the child will be albino?
A) 25%
B) 50%
C) 75%
D) 0%

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7. Which region of the lac operon does the repressor protein bind to?
- A) Promoter
 - B) Operator**
 - C) Enhancer
 - D) Terminator
8. Which small RNA molecules can regulate gene expression post-transcriptionally in an epigenetic manner?
- A) rRNA
 - B) tRNA
 - C) miRNA**
 - D) snRNA
9. Which factor is required for CRISPR-Cas9 to recognize and cut DNA?
- A) The presence of a PAM (Protospacer Adjacent Motif) sequence near the target**
 - B) DNA replication origin
 - C) Ribosomal binding site
 - D) mRNA transcript
10. Which of the following is an example of biopharming?
- A) Producing human vaccines in transgenic plants or animals**
 - B) Using CRISPR to edit microbial DNA
 - C) PCR amplification for diagnostics
 - D) RNA interference in crops
11. Which of the following hormones is responsible for regulating blood glucose levels?
- A) Insulin and glucagon**
 - B) Thyroxine and calcitonin
 - C) Adrenaline and cortisol
 - D) Testosterone and estrogen
12. Vaccines work primarily by:
- A) Directly killing pathogens
 - B) Stimulating the immune system to produce memory cells without causing disease**
 - C) Replacing innate immune cells
 - D) Producing toxins that neutralize pathogens
13. Herd immunity helps prevent outbreaks by:
- A) Eliminating the pathogen completely
 - B) Ensuring a high proportion of the population is immune**
 - C) Treating all infected individuals with antibiotics
 - D) Killing vectors with pesticides

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- 14. Synaptic transmission is chemical rather than electrical in most CNS synapses because:**
- A) Neurotransmitters diffuse across the synaptic cleft to bind receptors on the postsynaptic neuron**
 - B) Action potentials jump directly across the synapse
 - C) Ions cannot pass through membranes
 - D) Electrical impulses are too slow
- 15. Adaptive radiation refers to:**
- A) A single species evolving into multiple species to occupy different ecological niches**
 - B) Extinction of poorly adapted species
 - C) Stabilizing selection in a population
 - D) Loss of genetic diversity
- 16. Comparative anatomy provides evidence for evolution because:**
- A) All organisms have identical organs
 - B) Structural similarities suggest common ancestry**
 - C) Organ functions never change
 - D) DNA sequences cannot be compared
- 17. Endangered species are defined as:**
- A) Species abundant in a region
 - B) Species at risk of extinction in the near future**
 - C) Species introduced to a new habitat
 - D) Species with no predators
- 18. Urbanization contributes to climate change primarily through:**
- A) Reducing biodiversity
 - B) Increasing greenhouse gas emissions and heat island effects**
 - C) Enhancing groundwater recharge
 - D) Increasing photosynthesis
- 19. Fungi obtain nutrients primarily through:**
- A) Photosynthesis
 - B) Absorption from decaying matter**
 - C) Phagocytosis
 - D) Endocytosis of host cells
- 20. Which type of bacteria survives antibiotic treatment due to dormancy or slow metabolism?**
- A) Gram-positive bacteria
 - B) Persister cells**
 - C) Facultative anaerobes
 - D) Obligate aerobes

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21. Which of the following best describes a keystone microbial species?
- A) The most abundant species
 - B) A species whose presence has a disproportionate effect on ecosystem function**
 - C) A rare species with no ecological role
 - D) A pathogenic species only
22. The number of electrons in a neutral atom equals:
- A) Number of neutrons
 - B) Number of protons**
 - C) Mass number
 - D) Sum of protons and neutrons
23. Which statement about ionization energy is correct?
- A) It decreases across a period
 - B) It increases across a period**
 - C) It is highest for alkali metals
 - D) It is independent of nuclear charge
24. Which type of bond is present in diamond?
- A) Ionic**
 - B) Covalent (giant lattice)**
 - C) Metallic
 - D) Van der Waals
25. Which molecule has a linear shape according to VSEPR theory?
- A) BeCl_2**
 - B) H_2O
 - C) NH_3
 - D) BF_3

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