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Biology Grade 9 — Chapter 1

The Science of Biology

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Independent practice MCQs from the supplied Class 9 Biology notes pack. Total: 50 questions.

A. Important / Main Topics

1. The word "biology" is derived from two Greek words. What does "bios" mean?

(A) Life
(B) Study
(C) Reasoning
(D) Thought

Correct Answer: A

Explanation: Biology comes from the Greek words bios meaning life and logos meaning thought, reasoning, and study.

2. Which of the following is the correct definition of biology?

(A) The study of chemicals and their reactions
(B) The study of living organisms
(C) The study of the physical world
(D) The study of rocks and fossils

Correct Answer: B

Explanation: Biology is the study of living organisms. It helps explain how living things relate to one another and to their surroundings.

3. What is the first step in doing science, according to the text?

(A) Performing an experiment
(B) Drawing a conclusion
(C) Asking a question
(D) Forming a theory

Correct Answer: C

Explanation: The text states that much of the time, the first step in collecting information is asking a question.

4. Which of the following is NOT one of the three main divisions of biology?

(A) Botany
(B) Zoology
(C) Microbiology
(D) Ecology

Correct Answer: D

Explanation: The three main divisions of biology are Botany (plants), Zoology (animals), and Microbiology (microorganisms). Ecology is a sub-field, not a main division.

5. The study of the internal structure of organisms is called:

(A) Anatomy
(B) Morphology
(C) Physiology
(D) Histology

Correct Answer: A

Explanation: Anatomy is the study of the internal structure of organisms and is also called internal morphology.

6. Which branch of biology deals with the study of fossils?

(A) Embryology
(B) Paleontology

(C) Taxonomy
(D) Pathology

Correct Answer: B

Explanation: Paleontology is the study of the history of life on Earth as based on fossils.

7. The scientific name of humans is:

(A) Homo erectus
(B) Felis catus
(C) Homo sapiens
(D) Solanum tuberosum

Correct Answer: C

Explanation: The text states that humans are mammals and their scientific name is Homo sapiens.

8. The study of the interrelationship of organisms and their environment is called:

(A) Marine biology
(B) Genetics
(C) Immunology
(D) Ecology

Correct Answer: D

Explanation: Ecology is the study of the interrelationship of organisms and their environment, also known as environmental biology.

9. Which of the following is a biological problem?

(A) A question related to living organisms
(B) A question about the movement of planets
(C) A question about chemical reactions in a lab
(D) A question about the structure of atoms

Correct Answer: A

Explanation: A biological problem is a question related to living organisms.

10. The minimum amount of extra energy required to start a reaction is called:

(A) Kinetic energy
(B) Activation energy
(C) Potential energy
(D) Free energy

Correct Answer: B

Explanation: The energy of activation is the minimum amount of extra energy required to activate the molecule to react or start the reaction.

11. Who introduced the system of binomial nomenclature?

(A) Aristotle
(B) Charles Darwin
(C) Carolus Linnaeus
(D) Robert Hooke

Correct Answer: C

Explanation: Carolus Linnaeus introduced a naming system to give each organism a name consisting of two Latin names, called binomial nomenclature.

12. The biological name of rice is:

(A) Solanum tuberosum
(B) Solanum melongena
(C) Homo sapiens
(D) Oryza sativa

Correct Answer: D

Explanation: The text gives the biological name of rice as Oryza sativa.

13. Which Muslim scientist is mentioned in the text for contributing to the knowledge of plants and animals?

(A) Bu Ali Sina
(B) Ibn Khaldun
(C) Al-Khwarizmi
(D) Ibn Battuta

Correct Answer: A

Explanation: The text mentions Jabir Bin Hayyan, Abdul Malik Asmai, and Bu Ali Sina as Muslim scientists who contributed to biology.

14. Viruses are not included in any domain or kingdom because:

(A) They are too large
(B) They are at the borderline of living and non-living
(C) They are always harmful
(D) They cannot reproduce

Correct Answer: B

Explanation: Viruses show characteristics of both living and non-living things, so they are not included in any domain or kingdom under modern classification.

15. Which of the following is a non-living characteristic of viruses?

(A) They have genetic material
(B) They can reproduce inside a host
(C) They can be crystallized and stored in a bottle
(D) They cause diseases

Correct Answer: C

Explanation: One of the non-living characteristics of viruses is that they can be crystallized and stored in a bottle.

16. Which branch of biology is also called internal morphology?

(A) Histology
(B) Cytology
(C) Physiology
(D) Anatomy

Correct Answer: D

Explanation: Anatomy is the study of the internal structure of organisms and is also called internal morphology.

17. A scientist studying the functions of the human heart is working in which branch of biology?

(A) Physiology
(B) Anatomy
(C) Morphology
(D) Histology

Correct Answer: A

Explanation: Physiology is the study of the functions of various organs of organisms. Studying the functions of the heart is a physiological study.

18. Which sub-field of biology would be most directly involved in studying the immune system's response to a vaccine?

(A) Pharmacology
(B) Immunology
(C) Pathology
(D) Marine biology

Correct Answer: B

Explanation: Immunology is the study of immunity — the body's ability to protect itself from foreign substances. Vaccination is an example of immunization.

19. The study of the chemical constituents found in an organism and the chemical reactions taking place in it is called:

(A) Biophysics
(B) Biostatistics
(C) Biochemistry
(D) Computational biology

Correct Answer: C

Explanation: Biochemistry is the study of chemical constituents found in an organism and the chemical reactions taking place in the living organism.

20. The movement of muscles and bones can be explained by principles from which science?

(A) Chemistry
(B) Statistics
(C) Geography
(D) Physics

Correct Answer: D

Explanation: The text states that animals move, walk, or run on the principles of physics, and there is a similarity between the working principle of a lever and human limbs.

21. Which of the following correctly describes a quantitative observation?

(A) The plant is 15 cm tall
(B) The flower is red
(C) The leaf is smooth
(D) The fruit tastes sweet

Correct Answer: A

Explanation: Quantitative observations are based on measurable values and can be expressed in terms of numbers.

22. In the malaria study, Laveran's hypothesis was:

(A) Malaria is caused by marshy water
(B) Plasmodium is the cause of malaria
(C) Mosquitoes transmit malaria
(D) Quinine causes malaria

Correct Answer: B

Explanation: Laveran, a French physician, hypothesized in 1882 that Plasmodium is the cause of malaria.

23. In the malaria experiment, blood from 100 healthy persons was examined. What was the purpose of this?

(A) To serve as the experimental group
(B) To test the drug quinine
(C) To serve as the control group
(D) To identify mosquito species

Correct Answer: C

Explanation: The text states that blood from 100 healthy persons was examined for the purpose of having a control group.

24. The incubation period of malaria is the time between:

(A) Two mosquito bites
(B) Taking quinine and recovery
(C) Two cycles of fever
(D) Entry of the parasite and appearance of symptoms

Correct Answer: D

Explanation: The incubation period is defined as the time between the entry of the parasite into the host and the appearance of the symptoms of the disease.

25. Which scientist listed 20 observations in 1883 about the spread of malaria?

(A) A.F.A. King
(B) Laveran
(C) Ronald Ross

(D) Aristotle

Correct Answer: A

Explanation: An American scientist, A.F.A. King, listed 20 observations in 1883 about the spread of malaria.

B. Less Important / Secondary Topics

26. Ronald Ross's experiments with sparrows involved which mosquito?

(A) Culex
(B) Anopheles
(C) Aedes aegypti
(D) Drosophila

Correct Answer: A

Explanation: Ross allowed female Culex mosquitoes to bite sparrows suffering from malaria, then allowed these mosquitoes to bite healthy sparrows.

27. The term "vector" in biology refers to:

(A) The cause of a disease
(B) An organism that carries a parasite and transfers it
(C) A type of drug
(D) A method of classification

Correct Answer: B

Explanation: The word vector means transmitter. Any organism which carries a parasite and transfers it from one organism to another is called a vector.

28. A hypothesis is:

(A) A proven fact
(B) The final conclusion of an experiment
(C) A tentative explanation of observations that might be true
(D) A law of nature

Correct Answer: C

Explanation: A hypothesis is a tentative explanation of the observations that might be true.

29. Deductions in the biological method involve:

(A) Random guessing
(B) The final result of an experiment
(C) The collection of data
(D) "If" and "then" logic

Correct Answer: D

Explanation: Deductions are the logical consequences of the hypothesis and involve "if" and "then" logic.

30. Which of the following is true about a scientific theory compared to a hypothesis?

(A) A theory is supported by more evidence
(B) A theory is narrower in scope
(C) A theory is less reliable
(D) A theory is always a guess

Correct Answer: A

Explanation: A scientific theory is much broader in scope than a hypothesis and is generally supported by more evidence.

31. A biological law is formed when a theory is:

(A) First proposed
(B) Verified and has wide application
(C) Proven wrong
(D) Supported by a single experiment

Correct Answer: B

Explanation: A theory that has been verified and appears to have wide application may become a biological law, such as Mendel's law of inheritance.

32. Data analysis in scientific studies is often done by means of:

(A) Multiplication tables
(B) Geometry
(C) Ratio and proportion
(D) Trigonometry

Correct Answer: C

Explanation: The text states that analysis of data is done by means of ratio and proportion.

33. Which of the following is an example of a scientific name that uses binomial nomenclature?

(A) Brinjal
(B) Baigun
(C) Bataoon
(D) Solanum melongena

Correct Answer: D

Explanation: The biological name of brinjal is Solanum melongena, which is a binomial name (genus + species).

34. Why is Latin used for scientific names?

(A) Because it is a universal language that does not change
(B) Because it is easy to pronounce
(C) Because it is the most modern language
(D) Because it is spoken in every country

Correct Answer: A

Explanation: There was a need for a universal language such as Latin for scientific names to avoid confusion caused by different common names in different languages.

35. In binomial nomenclature, the species name begins with:

(A) A capital letter
(B) A small letter
(C) A number
(D) A symbol

Correct Answer: B

Explanation: The genus name begins with a capital letter, but the species name begins with a small letter.

36. A researcher observes that patients with a certain disease always have a specific bacterium in their blood. Which of the following would be the most appropriate deduction from the hypothesis "This bacterium causes the disease"?

(A) All healthy people should have the bacterium
(B) All people with the bacterium should have the disease
(C) The bacterium should be present in all patients with the disease
(D) The disease should be cured by antibiotics

Correct Answer: C

Explanation: The hypothesis states the bacterium causes the disease. The deduction follows "if...then" logic: if the bacterium causes the disease, then all patients with the disease should have the bacterium in their blood. This is analogous to Laveran's deduction about Plasmodium.

37. In the malaria study, 7 out of 100 healthy people had Plasmodium in their blood but showed no symptoms. How does the text explain this?

(A) The Plasmodium were dead
(B) The Plasmodium were a different species
(C) The test was inaccurate
(D) The Plasmodium were in the incubation period

Correct Answer: D

Explanation: The text explains that in the 7 healthy persons with Plasmodium in their blood, the parasite was in the incubation period. After a few days, they became ill with malaria.

38. Which of the following best explains why a scientific theory may be modified or rejected?

(A) New research methods may produce results that do not fit the theory
(B) Theories are always guesses
(C) Scientists prefer to change theories frequently
(D) Theories are only accepted for one year

Correct Answer: A

Explanation: The text states that scientists must sometimes modify or even reject theories when a new research method produces results that do not fit.

39. A student classifies organisms by grouping those with similar characteristics. This process is called:

(A) Evolution
(B) Classification
(C) Mutation
(D) Reproduction

Correct Answer: B

Explanation: Classification is the grouping of related facts into classes. To put organisms into separate groups on the basis of similarities and differences is called classification.

40. Which of the following is an example of a qualitative observation?

(A) The plant is 20 cm tall
(B) The temperature is 37°C
(C) The leaf is yellow
(D) The mass is 5 grams

Correct Answer: C

Explanation: Qualitative observations are based on some quality or characteristic, such as color. The other options involve measurable values (quantitative).

41. Why are quantitative observations considered more accurate than qualitative observations?

(A) They are easier to make
(B) They require no instruments
(C) They are based on personal opinion
(D) They are measurable and invariable

Correct Answer: D

Explanation: The text states that quantitative observations, being measurable, are invariable and can be expressed in terms of numbers, so they are more accurate.

42. A hypothesis must be "testable and potentially falsifiable." What does this mean?

(A) There must be a way to test it and potentially prove it wrong
(B) It must be proven true immediately
(C) It must be accepted by all scientists
(D) It must be a law

Correct Answer: A

Explanation: A hypothesis should be testable (there is a way to test it) and potentially falsifiable (there is a possibility of proving it wrong).

43. In the malaria study, why was it important that "drinking the water of marshes does not cause malaria" was one of the observations?

(A) It proved mosquitoes cause malaria
(B) It ruled out marsh water as the direct cause, suggesting another agent
(C) It showed quinine is ineffective
(D) It proved Plasmodium is harmless

Correct Answer: B

Explanation: Since malaria was associated with marshes but drinking marsh water did not cause it, the cause must be carried by something else that comes to marshy water. This led to the mosquito hypothesis.

44. Which of the following is a non-living characteristic of viruses?

(A) They have their own genetic material
(B) They reproduce inside a host cell
(C) They do not respire
(D) They cause diseases

Correct Answer: C

Explanation: The non-living characteristics of viruses include: they lack cellular structure and enzyme system, they can be crystallized, they do not respire, and they behave as non-living, inert infectious particles outside the host.

45. Prions are composed of:

(A) DNA only
(B) RNA only
(C) Lipids only
(D) Proteins only

Correct Answer: D

Explanation: The text states that prions are composed of proteins only.

46. Viroids are composed of:

(A) Circular RNA only
(B) Proteins only
(C) DNA only
(D) Carbohydrates only

Correct Answer: A

Explanation: The text states that viroids are composed of circular RNA only.

47. What do prions and viroids have in common?

(A) Both are composed of DNA
(B) Both cause infectious diseases in certain plants
(C) Both are cellular organisms
(D) Both are classified in the kingdom Monera

Correct Answer: B

Explanation: The text states that both prions and viroids cause infectious diseases in certain plants, and both are acellular particles not included in any kingdom.

48. A scientist discovers a new organism that has cells with a nucleus. Based on the three-domain system, to which domain does it belong?

(A) Archaea
(B) Bacteria
(C) Eukarya
(D) Monera

Correct Answer: C

Explanation: Organisms with a nucleus in their cells are eukaryotes and belong to the domain Eukarya. Archaea and Bacteria are prokaryotic (lack a nucleus).

49. Which of the following correctly matches a scientist with their contribution?

(A) Aristotle — binomial nomenclature
(B) Carolus Linnaeus — three-domain system
(C) Carl Woese — binomial nomenclature
(D) Carolus Linnaeus — binomial nomenclature

Correct Answer: D

Explanation: Carolus Linnaeus — binomial nomenclature — this correctly answers the question.

50. A researcher wants to test whether a new fertilizer increases plant height. She grows 50 plants with fertilizer and 50 without, keeping all other conditions the same. Which is the control group?

(A) The 50 plants without fertilizer
(B) The 50 plants with fertilizer
(C) The researcher
(D) The fertilizer

Correct Answer: A

Explanation: The control group is the group not exposed to the experimental treatment. In this case, the 50 plants without fertilizer serve as the control group to compare against the experimental group (with fertilizer). Answer.