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Biology Grade 9 — Complete MCQs

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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.

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Biology Grade 9 — Chapter 2

Biodiversity

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

A. Important / Main Topics

1. The term biodiversity comes from:

(A) Biological diversity
(B) Biological variety
(C) Biotic diversity
(D) Biosphere diversity

Correct Answer: A

Explanation: The term biodiversity comes from biological diversity.

2. Biodiversity is defined as the variety of:

(A) Ecosystems
(B) Living organisms on earth
(C) Non-living things
(D) Climates

Correct Answer: B

Explanation: Biodiversity is defined as "the variety of living organism on earth.".

3. How many naturally occurring elements are there on Earth, out of which 16 are bioelements?

(A) 16
(B) 50
(C) 92
(D) 118

Correct Answer: C

Explanation: Out of 92 naturally occurring elements of Earth, 16 are bioelements.

4. The branch of biology concerned with identification, naming, and classification of organisms is called:

(A) Ecology
(B) Systematics
(C) Morphology
(D) Taxonomy

Correct Answer: D

Explanation: Taxonomy is the branch of biology concerned with identification, naming, and classification of organisms.

5. Who was the first person to classify living organisms?

(A) Aristotle
(B) Carolus Linnaeus
(C) Carl Woese
(D) Robert Whittaker

Correct Answer: A

Explanation: Aristotle — this correctly answers the question.

6. How many kingdoms are there in Robert Whittaker's classification system?

(A) Two
(B) Five
(C) Three

(D) Four

Correct Answer: B

Explanation: Robert Whittaker introduced the five-kingdom classification system in 1967. The five kingdoms are Monera, Protista, Fungi, Plantae, and Animalia.

7. Which domain includes organisms that often live in extreme environments?

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

Correct Answer: C

Explanation: Archaea often live in extreme environments, and their membranes can withstand higher temperatures and stronger acid concentrations.

8. The domain Eukarya is divided into how many kingdoms?

(A) Two
(B) Three
(C) Five
(D) Four

Correct Answer: D

Explanation: The domain Eukarya is divided into four kingdoms: Protista, Fungi, Plantae, and Animalia.

9. The scientific study of the diversity of organisms and their evolutionary relationship is called:

(A) Systematics
(B) Taxonomy
(C) Classification
(D) Paleontology

Correct Answer: A

Explanation: Systematics is the scientific study of the diversity of organisms and their evolutionary relationship.

10. What is the most basic unit of classification?

(A) Genus
(B) Species
(C) Family
(D) Kingdom

Correct Answer: B

Explanation: Species is the most basic unit of classification, as well as a taxonomic rank.

11. Which of the following is the correct order of taxonomic ranks from largest to smallest?

(A) Kingdom → Domain → Phylum → Class → Order → Family → Genus → Species
(B) Species → Genus → Family → Order → Class → Phylum → Kingdom → Domain
(C) Domain → Kingdom → Phylum → Class → Order → Family → Genus → Species
(D) Domain → Kingdom → Class → Phylum → Order → Family → Genus → Species

Correct Answer: C

Explanation: The correct order from largest to smallest is Domain → Kingdom → Phylum → Class → Order → Family → Genus → Species.

12. Who introduced binomial nomenclature?

(A) Aristotle
(B) Ernst Haeckel
(C) Robert Whittaker
(D) Carolus Linnaeus

Correct Answer: D

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

13. In binomial nomenclature, the genus name begins with a:

(A) Capital letter
(B) Small letter
(C) Number
(D) Symbol

Correct Answer: A

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

14. Which of the following is a living characteristic of viruses?

(A) They can be crystallized
(B) They have their own genetic material
(C) They do not respire
(D) They lack cellular structure

Correct Answer: B

Explanation: Having their own genetic material (RNA or DNA) is a living characteristic of viruses.

15. Prions are composed of:

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

Correct Answer: C

Explanation: Prions are composed of proteins only.

16. Which of the following is an ecological importance of biodiversity?

(A) Providing building materials
(B) Providing medicines
(C) Providing fibres for clothing
(D) Helping the carbon cycle

Correct Answer: D

Explanation: Helping the carbon cycle is an ecological importance. The others are economic importance.

17. Pests are controlled by organisms such as:

(A) Insects, birds, and fungi
(B) Only chemicals
(C) Only birds
(D) Only bacteria

Correct Answer: A

Explanation: The text states that pests are controlled by organisms such as insects, birds, and fungi.

18. The main aims of classification include all of the following EXCEPT:

(A) To determine similarities and differences between organisms
(B) To create confusion among scientists
(C) To arrange organisms on the basis of similarities and differences
(D) To find out evolutionary relationships among organisms

Correct Answer: B

Explanation: The main aims of classification include all of the following EXCEPT To create confusion among scientists.

19. In the two-kingdom system, bacteria, fungi, and algae were included in the kingdom:

(A) Animalia
(B) Protista
(C) Plantae
(D) Monera

Correct Answer: C

Explanation: The kingdom Plantae included autotrophs, and bacteria, fungi, and algae were also included in this kingdom.

20. Which organism has both plant-like and animal-like characteristics, leading to the creation of the kingdom Protista?

(A) Rose
(B) Mango
(C) Fowl
(D) Euglena

Correct Answer: D

Explanation: Euglena has chlorophyll (plant-like) and heterotrophic nutrition in darkness with no cell wall (animal-like).

21. Who proposed the three-kingdom classification system?

(A) Ernst Haeckel
(B) Aristotle
(C) Robert Whittaker
(D) Carl Woese

Correct Answer: A

Explanation: Ernst Haeckel — this correctly answers the question.

22. In which year did Robert Whittaker introduce the five-kingdom system?

(A) 1937
(B) 1967
(C) 1882
(D) 1990

Correct Answer: B

Explanation: 1967 — this correctly answers the question.

23. Who introduced the three-domain system of classification?

(A) Aristotle
(B) Robert Whittaker
(C) Carl Woese
(D) Ernst Haeckel

Correct Answer: C

Explanation: Carl Woese — this correctly answers the question.

24. Classification into three domains is based on all of the following EXCEPT:

(A) Sequence of nucleotides in rRNA
(B) Cell membrane lipid structure
(C) Sensitivity to antibiotics
(D) Body size of the organism

Correct Answer: D

Explanation: Classification into three domains is based on rRNA sequence, cell membrane lipid structure, and sensitivity to antibiotics, not body size.

25. The cell walls of bacteria contain:

(A) Peptidoglycan
(B) Chitin
(C) Cellulose
(D) Lignin

Correct Answer: A

Explanation: The cell walls of bacteria contain Peptidoglycan.

B. Less Important / Secondary Topics

26. Which kingdom includes multicellular heterotrophic eukaryotes that lack a cell wall and can generally move?

(A) Animalia
(B) Plantae
(C) Fungi
(D) Protista

Correct Answer: A

Explanation: Animalia — this correctly answers the question.

27. Fungi have which substance in their cell walls?

(A) Cellulose
(B) Chitin
(C) Peptidoglycan
(D) Lignin

Correct Answer: B

Explanation: Chitin — this correctly answers the question.

28. Organisms that depend on dead, decaying matter are called:

(A) Autotrophs
(B) Heterotrophs
(C) Saprotrophs
(D) Producers

Correct Answer: C

Explanation: Organisms that depend on dead, decaying matter are called Saprotrophs.

29. A phylum is a group of related:

(A) Orders
(B) Families
(C) Genera
(D) Classes

Correct Answer: D

Explanation: A phylum is a group of related classes.

30. A class is a group of related:

(A) Orders
(B) Phyla
(C) Families
(D) Species

Correct Answer: A

Explanation: A class is a group of related orders.

31. A genus is a group of related:

(A) Families
(B) Species
(C) Orders
(D) Classes

Correct Answer: B

Explanation: A genus is a group of related species.

32. Why is a mule not considered a species?

(A) It has an even number of chromosomes
(B) It is too large
(C) It is infertile
(D) It lacks reproductive organs

Correct Answer: C

Explanation: A mule is infertile because of the odd number of chromosomes, so it cannot reproduce and is not considered a species.

33. The biological name of brinjal is:

(A) Solanum tuberosum
(B) Oryza sativa
(C) Felis catus
(D) Solanum melongena

Correct Answer: D

Explanation: The biological name of brinjal is Solanum melongena.

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

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

Correct Answer: A

Explanation: The ability to be crystallized and stored is a non-living characteristic of viruses.

35. Viroids are composed of:

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

Correct Answer: B

Explanation: Viroids are composed of circular RNA only.

36. A scientist discovers a new unicellular organism that has a nucleus, is aquatic, and moves using pseudopodi

(A) To which kingdom does it most likely belong? A. Monera
(B) Fungi
(C) Protista
(D) Animalia

Correct Answer: C

Explanation: "Protista" is correct: it matches the idea asked in the question ("A scientist discovers a new unicellular organism that has a nucleus, is aquatic, and moves using pseudopodi"), while the other choices do not.

37. Which of the following best explains why the two-kingdom system was replaced?

(A) It had too many kingdoms
(B) It was too complicated
(C) It did not include bacteria
(D) Organisms like Euglena had both plant-like and animal-like characteristics

Correct Answer: D

Explanation: Euglena has chlorophyll (plant-like) and heterotrophic nutrition in darkness with no cell wall (animal-like), making the two-kingdom system inadequate.

38. Which of the following correctly distinguishes Archaea from Bacteria?

(A) Archaea lack peptidoglycan in their cell walls; Bacteria have peptidoglycan
(B) Archaea are eukaryotic; Bacteria are prokaryotic
(C) Archaea are multicellular; Bacteria are unicellular
(D) Archaea are sensitive to traditional antibacterial antibiotics; Bacteria are not

Correct Answer: A

Explanation: Archaea lack peptidoglycan in their cell walls; Bacteria have peptidoglycan — this correctly answers the question.

39. A scientist is classifying a newly discovered organism. It is multicellular, autotrophic, has cellulose in its cell wall, and contains chloroplasts. To which kingdom does it belong?

(A) Protista
(B) Plantae
(C) Fungi
(D) Animalia

Correct Answer: B

Explanation: Members of kingdom Plantae are eukaryotic, multicellular, and autotrophic with chloroplasts containing chlorophyll. Their cell wall is made up of cellulose.

40. Which of the following statements about viruses is correct?

(A) They are included in the kingdom Monera
(B) They are classified in the domain Archaea
(C) They are not included in any domain or kingdom
(D) They are classified as fungi

Correct Answer: C

Explanation: Because viruses are at the borderline of living and non-living, they are not included in any domain or kingdom under modern classification.

41. In binomial nomenclature, if the genus name is Felis and the species name is catus, what is the correct scientific name?

(A) Felis Catus
(B) felis catus
(C) FELIS CATUS
(D) Felis catus

Correct Answer: D

Explanation: The genus name begins with a capital letter (Felis) and the species name begins with a small letter (catus).

42. Which of the following best explains why Latin is used for scientific names?

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

Correct Answer: A

Explanation: It is a universal language that does not change — this correctly answers the question.

43. A farmer notices that his brinjal crop is being damaged by pests. Which of the following would be the most direct example of biodiversity's role in controlling pests?

(A) Using chemical pesticides
(B) Introducing birds and fungi that feed on the pests
(C) Increasing fertilizer use
(D) Planting more brinjal

Correct Answer: B

Explanation: The text states that pests are controlled by organisms such as insects, birds, and fungi.

44. Which of the following statements about the three domains is correct?

(A) Bacteria and Archaea both have peptidoglycan in their cell walls
(B) Archaea are sensitive to traditional antibacterial antibiotics
(C) Eukarya are resistant to traditional antibacterial antibiotics
(D) Bacteria are eukaryotic

Correct Answer: C

Explanation: Eukarya are resistant to traditional antibacterial antibiotics but are sensitive to most antibiotics that affect eukaryotic cells.

45. An organism has cells with a nucleus but no cell wall. It is multicellular and heterotrophic. To which kingdom does it belong?

(A) Plantae
(B) Fungi
(C) Protista
(D) Animalia

Correct Answer: D

Explanation: Animalia — this correctly answers the question.

46. Which of the following correctly describes the cell wall composition of different organisms?

(A) Plantae: cellulose; Fungi: chitin; Bacteria: peptidoglycan
(B) Plantae: chitin; Fungi: cellulose; Bacteria: peptidoglycan
(C) Plantae: peptidoglycan; Fungi: cellulose; Bacteria: chitin
(D) Plantae: cellulose; Fungi: peptidoglycan; Bacteria: chitin

Correct Answer: A

Explanation: The text states that Plantae have cellulose in their cell walls, fungi have chitin, and bacteria have peptidoglycan.

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 is studying a newly discovered organism. It is unicellular, has a cell wall with peptidoglycan, and is sensitive to traditional antibacterial antibiotics. To which domain does it belong?

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

Correct Answer: C

Explanation: Bacteria are prokaryotic, have peptidoglycan in their cell walls, and are sensitive to traditional antibacterial antibiotics.

49. 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).

50. Which of the following statements about the kingdom Fungi is correct?

(A) Fungi are saprotrophic decomposers
(B) Fungi are autotrophic
(C) Fungi have cellulose in their cell walls
(D) Fungi are always unicellular

Correct Answer: A

Explanation: Fungi are saprotrophic decomposers — this correctly answers the question.

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Biology Grade 9 — Chapter 3

The Cell

by Public Library

Independent practice MCQs from the supplied Class 9 Biology notes pack. Total: 49 questions.

A. Important / Main Topics

1. Who discovered the cell in 1665?

(A) Robert Hooke
(B) Camillo Golgi
(C) Robert Brown
(D) Anton van Leeuwenhoek

Correct Answer: A

Explanation: Robert Hooke discovered the cell in 1665 when he examined a thin slice of cork tissue under a compound microscope.

2. The cell is considered the:

(A) Largest unit of life
(B) Basic unit of structure and function of all living organisms
(C) Only unit of reproduction
(D) Smallest organelle

Correct Answer: B

Explanation: The cell is the basic unit of structure and function of all living organisms.

3. The cell wall of plants is made up of:

(A) Chitin
(B) Peptidoglycan
(C) Cellulose
(D) Lignin

Correct Answer: C

Explanation: The cell wall of plants is made up of Cellulose.

4. The fluid mosaic model explains the structure of the:

(A) Nucleus
(B) Cell wall
(C) Ribosome
(D) Cell membrane

Correct Answer: D

Explanation: The structure of the cell membrane is explained according to the fluid mosaic model.

5. The site of protein synthesis in the cell is the:

(A) Ribosome
(B) Lysosome
(C) Smooth endoplasmic reticulum
(D) Golgi body

Correct Answer: A

Explanation: Ribosomes are the site of protein synthesis.

6. Which organelle is known as the powerhouse of the cell?

(A) Chloroplast
(B) Mitochondria
(C) Ribosome
(D) Golgi apparatus

Correct Answer: B

Explanation: Mitochondria produce energy in the form of ATP, that is why they are called the powerhouse of the cell.

7. The membrane of the plant vacuole is called the:

(A) Plasmalemma
(B) Cristae
(C) Tonoplast
(D) Thylakoid

Correct Answer: C

Explanation: The membrane of the plant vacuole is called the tonoplast.

8. Which organelle contains its own DNA and ribosomes?

(A) Golgi apparatus
(B) Lysosome
(C) Ribosome
(D) Mitochondria

Correct Answer: D

Explanation: Mitochondria have their own DNA and ribosomes and can multiply within the cell at their own.

9. Centrioles are found in:

(A) Animal cells
(B) Plant cells only
(C) Bacterial cells
(D) Fungal cells

Correct Answer: A

Explanation: Centrioles are hollow open-ended cylinder-like structures found in animal cells.

10. The control centre of the cell is the:

(A) Cytoplasm
(B) Nucleus
(C) Ribosome
(D) Golgi apparatus

Correct Answer: B

Explanation: The nucleus acts as the control centre of the cell because it contains hereditary material DNA.

11. Which of the following is a characteristic of red blood cells?

(A) They have a large nucleus
(B) They contain many mitochondria
(C) They are biconcave disk-shaped
(D) They are cube-shaped

Correct Answer: C

Explanation: Red blood cells are biconcave disk-shaped, which provides more surface area to absorb and release oxygen.

12. The cells responsible for coordination in the animal body are:

(A) Muscle cells
(B) Liver cells
(C) Red blood cells
(D) Neurons

Correct Answer: D

Explanation: Neurons are the cells of the nervous system and are responsible for coordination in the animal body.

13. A group of cells performing the same function is called a:

(A) Tissue
(B) Organ
(C) Organ system

(D) Organelle

Correct Answer: A

Explanation: A group of cells performing the same function is called a tissue.

14. The zygote is described as:

(A) A fully differentiated cell
(B) A very basic stem cell
(C) A muscle cell
(D) A red blood cell

Correct Answer: B

Explanation: The zygote is the very basic stem cell which has the ability to produce all kinds of cells in an organism.

15. Mesophyll cells contain a large number of:

(A) Mitochondria
(B) Ribosomes
(C) Chloroplasts
(D) Lysosomes

Correct Answer: C

Explanation: Mesophyll cells contain a large number of chloroplasts for photosynthesis.

16. Which of the following is NOT a function of the cell membrane?

(A) Acts as a barrier
(B) Regulates exchange of materials
(C) Maintains a fixed environment inside the cell
(D) Synthesizes proteins

Correct Answer: D

Explanation: Protein synthesis is the function of ribosomes, not the cell membrane.

17. Which part of the cell membrane prevents stiffening?

(A) Cholesterol
(B) Phospholipids
(C) Proteins
(D) Carbohydrates

Correct Answer: A

Explanation: Cholesterol — this correctly answers the question.

18. Which organelle is involved in the synthesis of lipids and steroids?

(A) Rough endoplasmic reticulum
(B) Smooth endoplasmic reticulum
(C) Golgi apparatus
(D) Lysosome

Correct Answer: B

Explanation: Smooth endoplasmic reticulum — this correctly answers the question.

19. Which organelle modifies and packages materials into vesicles?

(A) Ribosome
(B) Mitochondria
(C) Golgi apparatus
(D) Lysosome

Correct Answer: C

Explanation: Golgi apparatus — this correctly answers the question.

20. The process by which lysosomes digest unwanted cell organelles is called:

(A) Phagocytosis
(B) Exocytosis
(C) Osmosis

(D) Autophagy

Correct Answer: D

Explanation: The process by which lysosomes digest unwanted cell organelles is called Autophagy.

21. Which of the following is NOT a function of the liver cells?

(A) Transport of oxygen
(B) Storage of glycogen
(C) Detoxification of toxic substances
(D) Production of clotting proteins

Correct Answer: A

Explanation: Transport of oxygen is a function of red blood cells, not liver cells.

22. The average age of red blood cells is:

(A) 30 days
(B) 120 days
(C) 60 days
(D) 180 days

Correct Answer: B

Explanation: The average age of RBCs is 120 days.

23. Which of the following is a modified epidermal cell that regulates the opening and closing of stomata?

(A) Root hair cell
(B) Mesophyll cell
(C) Guard cell
(D) Neuron

Correct Answer: C

Explanation: Guard cell — this correctly answers the question.

24. Which type of muscle cell is found in the heart?

(A) Skeletal muscle
(B) Smooth muscle
(C) Striated muscle
(D) Cardiac muscle

Correct Answer: D

Explanation: Cardiac muscle cells are found in the heart.

B. Less Important / Secondary Topics

25. During which phase of cell division do centrioles duplicate and move to opposite poles?

(A) Start of cell division
(B) Interphase
(C) Telophase
(D) Cytokinesis

Correct Answer: A

Explanation: Start of cell division — this correctly answers the question.

26. Which of the following is a function of the cytoskeleton?

(A) Photosynthesis
(B) Providing mechanical support to the cell
(C) Synthesizing proteins
(D) Digesting waste

Correct Answer: B

Explanation: The cytoskeleton provides mechanical support to the cell and is involved in movement.

27. Cilia and flagella consist of:

(A) Nine triplets of microtubules
(B) Actin filaments
(C) Nine pairs of microtubules surrounding a single central pair
(D) Keratin filaments

Correct Answer: C

Explanation: Cilia and flagella consist of nine pairs of microtubules which surround a single central pair of microtubules.

28. Which of the following is a function of the nucleus?

(A) Producing ATP
(B) Synthesizing proteins
(C) Digesting waste
(D) Acting as the control centre of the cell

Correct Answer: D

Explanation: The nucleus acts as the control centre of the cell because it contains hereditary material DNA.

29. Which type of plastid is responsible for photosynthesis?

(A) Chloroplast
(B) Chromoplast
(C) Leucoplast
(D) Tonoplast

Correct Answer: A

Explanation: Chloroplast — this correctly answers the question.

30. Chromoplasts are found in:

(A) Roots and bulbs
(B) Flower petals and ripened fruits
(C) Stems and leaves
(D) Seeds and tubers

Correct Answer: B

Explanation: Chromoplasts are found in flower petals to attract insects and in ripened fruits to attract birds and animals.

31. Which of the following is a non-membrane-bound organelle?

(A) Mitochondria
(B) Lysosome
(C) Ribosome
(D) Golgi apparatus

Correct Answer: C

Explanation: Ribosomes are not bound by any membrane.

32. The fluid inside the mitochondrion is called the:

(A) Stroma
(B) Cristae
(C) Cytoplasm
(D) Matrix

Correct Answer: D

Explanation: The fluid inside the mitochondrion is called the matrix.

33. Which of the following is a function of the cell wall in plants?

(A) Providing support and shape
(B) Synthesizing proteins
(C) Producing ATP
(D) Digesting waste

Correct Answer: A

Explanation: The cell wall supports the structure of individual cells and the plant as a whole. It protects and gives shape to the cell.

34. Which of the following is an advantage of animal cells lacking a cell wall?

(A) They can withstand high osmotic pressure
(B) They are flexible and can move
(C) They can store large volumes of water
(D) They can become turgid

Correct Answer: B

Explanation: Animal cells lack cell walls, which makes them very flexible. Animal cells can move.

35. Which of the following cells is responsible for transporting oxygen in the body?

(A) Muscle cells
(B) Neurons
(C) RBCs
(D) Liver cells

Correct Answer: C

Explanation: RBCs — this correctly answers the question.

36. A student observes a cell under the microscope. It has a rigid outer layer, a large central vacuole, and chloroplasts. What type of cell is it?

(A) Animal cell
(B) Bacterial cell
(C) Fungal cell
(D) Plant cell

Correct Answer: D

Explanation: The presence of a rigid cell wall, a large central vacuole, and chloroplasts are characteristics of plant cells.

37. Why do red blood cells lack a nucleus and mitochondria?

(A) To accommodate more haemoglobin
(B) To help them divide faster
(C) To store more water
(D) To produce more ATP

Correct Answer: A

Explanation: The absence of a nucleus, mitochondria, and endoplasmic reticulum in RBCs helps to accommodate more haemoglobin, which is necessary for oxygen transport.

38. A cell is placed in a solution with a higher solute concentration than the cell's cytoplasm. What will happen to the cell?

(A) It will become turgid
(B) It will shrink and become flaccid
(C) It will burst
(D) Nothing will happen

Correct Answer: B

Explanation: It will shrink and become flaccid — this correctly answers the question.

39. Which of the following statements about the cell wall is correct?

(A) It is present in all eukaryotic cells
(B) It is made of cellulose in fungi
(C) It is absent in animals and animal-like protists
(D) It is made of chitin in plants

Correct Answer: C

Explanation: The cell wall is absent in animals and animal-like protists (protozoa). Algae have cellulose in their cell wall, fungal cell walls are made of chitin, and prokaryotes have peptidoglycan.

40. Which of the following organelles is involved in the formation of cilia and flagella?

(A) Ribosome
(B) Lysosome
(C) Golgi apparatus
(D) Centriole

Correct Answer: D

Explanation: Centrioles are involved in the formation of cilia and flagella.

41. A scientist is studying a cell that has a nucleus, mitochondria, and chloroplasts. Which of the following conclusions is most accurate?

(A) It is a plant cell
(B) It is an animal cell
(C) It is a bacterial cell
(D) It is a fungal cell

Correct Answer: A

Explanation: It is a plant cell — this correctly answers the question.

42. Which of the following statements about the fluid mosaic model is correct?

(A) Proteins form a rigid layer on the outside of the membrane
(B) Phospholipids form a double layer with proteins embedded in a mosaic fashion
(C) The membrane is composed entirely of proteins
(D) The membrane is composed entirely of carbohydrates

Correct Answer: B

Explanation: The fluid mosaic model postulates that the cell membrane consists of a double layer of phospholipids in which proteins are incorporated in a mosaic fashion.

43. Which of the following best explains why plant cells can become turgid while animal cells cannot?

(A) Plant cells have a nucleus; animal cells do not
(B) Plant cells have chloroplasts; animal cells do not
(C) Plant cells have a rigid cell wall; animal cells lack a cell wall
(D) Plant cells have mitochondria; animal cells do not

Correct Answer: C

Explanation: Plant cells can become turgid due to the presence of a cell wall, which allows plant parts to maintain structure and stay upright. Animal cells lack a cell wall and cannot become turgid.

44. Which of the following is a function of the Golgi apparatus?

(A) Producing ATP
(B) Synthesizing proteins
(C) Digesting waste
(D) Modifying and packaging materials into vesicles

Correct Answer: D

Explanation: Modifying and packaging materials into vesicles — this correctly answers the question.

45. Which of the following organelles is involved in the synthesis of proteins?

(A) Ribosome
(B) Lysosome
(C) Chloroplast
(D) Vacuole

Correct Answer: A

Explanation: Ribosomes are the site of protein synthesis.

46. Which of the following statements about stem cells is correct?

(A) They are fully differentiated cells
(B) They are unspecialized and can differentiate into other cell types
(C) They can only produce one type of cell

(D) They are found only in plants

Correct Answer: B

Explanation: Stem cells are unspecialized and have the ability to divide and differentiate into various specialized cell types.

47. Which of the following is a function of the vacuole in plant cells?

(A) Synthesizing proteins
(B) Producing ATP
(C) Maintaining turgor pressure
(D) Digesting waste

Correct Answer: C

Explanation: The primary role of the central vacuole in a plant cell is to maintain turgor pressure within the plant cell.

48. Which of the following correctly matches an organelle with its function?

(A) Mitochondria — protein synthesis
(B) Ribosome — ATP production
(C) Golgi apparatus — photosynthesis
(D) Lysosome — intracellular digestion

Correct Answer: D

Explanation: Lysosomes contain digestive enzymes and are involved in intracellular digestion and autophagy.

49. Which of the following statements about the cell membrane is correct?

(A) It is semipermeable, allowing some molecules to move across but not others
(B) It is permeable to all substances
(C) It is completely impermeable
(D) It is made entirely of proteins

Correct Answer: A

Explanation: The cell membrane is semipermeable, so some molecules can move across the lipid bilayer but others are blocked. It regulates the exchange of materials between the cell and its environment. Answer.

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Biology Grade 9 — Chapter 4

Cell Cycle

by Public Library

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

A. Important / Main Topics

1. The cell cycle is the sequence of events involving:

(A) Growth, genome replication, and division
(B) Only cell division
(C) Only DNA replication
(D) Only cell growth

Correct Answer: A

Explanation: The cell cycle is the sequence of events involving Growth, genome replication, and division.

2. The two main phases of the cell cycle are:

(A) G□ and G□
(B) Interphase and Mitotic phase
(C) Prophase and Metaphase
(D) S phase and M phase

Correct Answer: B

Explanation: The two main phases of the cell cycle are Interphase and Mitotic phase.

3. Which phase of interphase is the synthesis phase of DNA?

(A) G□ phase
(B) G□ phase
(C) S phase
(D) M phase

Correct Answer: C

Explanation: The S phase is the synthesis phase of DNA, where the cell replicates its entire genetic material.

4. The major components of the spindle apparatus are:

(A) Microfilaments
(B) Intermediate filaments
(C) Actin
(D) Microtubules

Correct Answer: D

Explanation: Major components of the cytoskeleton (and the spindle apparatus) are microtubules.

5. Mitosis produces:

(A) Two daughter cells with the same chromosome number
(B) Four daughter cells with half the chromosome number
(C) Two daughter cells with half the chromosome number
(D) One daughter cell

Correct Answer: A

Explanation: Mitosis produces two daughter cells with the same number of chromosomes as the parent cell.

6. Which is the longest phase of mitosis?

(A) Metaphase
(B) Prophase
(C) Anaphase
(D) Telophase

Correct Answer: B

Explanation: Prophase is the longest phase of cell division.

7. During which phase of mitosis do chromosomes align at the equator?

(A) Prophase
(B) Anaphase
(C) Metaphase
(D) Telophase

Correct Answer: C

Explanation: In metaphase, chromosomes are aligned at the equator of the spindle.

8. In animal cells, cytokinesis occurs by the formation of a:

(A) Cell plate
(B) Phragmoplast
(C) Middle lamella
(D) Cleavage furrow

Correct Answer: D

Explanation: In animal cells, the cell membrane invaginates to form a cleavage furrow that separates the two daughter cells.

9. Meiosis produces:

(A) Four haploid cells
(B) Two diploid cells
(C) Two haploid cells
(D) Four diploid cells

Correct Answer: A

Explanation: Meiosis gives rise to four daughter cells, each with half the number of chromosomes (haploid).

10. Meiosis occurs in:

(A) Somatic cells
(B) Germ line cells
(C) Epithelial cells
(D) Muscle cells

Correct Answer: B

Explanation: Meiosis occurs in Germ line cells.

11. The pairing of homologous chromosomes during Prophase I is called:

(A) Crossing over
(B) Chiasma
(C) Synapsis
(D) Bivalent

Correct Answer: C

Explanation: The pairing process of homologous chromosomes is called synapsis.

12. The exchange of segments between non-sister chromatids is called:

(A) Synapsis
(B) Chiasma
(C) Independent assortment
(D) Crossing over

Correct Answer: D

Explanation: Crossing over is the exchange of segments of non-sister chromatids during Prophase I.

13. How many chromosomes do human gametes have?

(A) 23
(B) 46
(C) 92
(D) 12

Correct Answer: A

Explanation: 23 — this correctly answers the question.

14. In plants, meiosis takes place during:

(A) Vegetative propagation
(B) Spore formation
(C) Budding
(D) Grafting

Correct Answer: B

Explanation: In plants, meiosis takes place during Spore formation.

15. Which of the following is a difference between mitosis and meiosis?

(A) Mitosis produces four cells; meiosis produces two
(B) Mitosis involves crossing over; meiosis does not
(C) Mitosis produces diploid cells; meiosis produces haploid cells
(D) Mitosis occurs in germ line cells; meiosis occurs in somatic cells

Correct Answer: C

Explanation: Mitosis produces diploid cells; meiosis produces haploid cells — this correctly answers the question.

16. During which phase does the cell grow in size and increase its organelles?

(A) S phase
(B) G□ phase
(C) M phase
(D) G□ phase

Correct Answer: D

Explanation: G□ phase — this correctly answers the question.

17. Sister chromatids are formed during:

(A) S phase
(B) G□ phase
(C) G□ phase
(D) M phase

Correct Answer: A

Explanation: Sister chromatids are formed during S phase.

18. During which phase does the cell prepare for the mitotic phase by forming spindle fibre proteins?

(A) G□ phase
(B) G□ phase
(C) S phase
(D) G□ phase

Correct Answer: B

Explanation: During G□, the cell forms proteins required for spindle fibres and prepares for mitosis.

19. Which cells remain in G□ permanently?

(A) Liver cells
(B) Kidney cells
(C) Neurons
(D) Epithelial cells

Correct Answer: C

Explanation: Neurons — this correctly answers the question.

20. Which cells divide continuously and never enter G□?

(A) Neurons
(B) Liver cells
(C) Kidney cells
(D) Epithelial cells

Correct Answer: D

Explanation: Epithelial cells — this correctly answers the question.

21. During which phase do centromeres split and chromatids separate?

(A) Anaphase
(B) Prophase
(C) Metaphase
(D) Telophase

Correct Answer: A

Explanation: In anaphase, centromeres split and chromatids are pulled to opposite poles.

22. In which phase does the nuclear membrane reform?

(A) Prophase
(B) Telophase
(C) Metaphase
(D) Anaphase

Correct Answer: B

Explanation: In telophase, the nuclear membrane is formed around chromatin at each pole.

23. In plant cells, cytokinesis involves the formation of a:

(A) Cleavage furrow
(B) Centriole
(C) Phragmoplast
(D) Lysosome

Correct Answer: C

Explanation: In plant cells, cytokinesis involves the formation of a Phragmoplast.

24. Which of the following is NOT a significance of mitosis?

(A) Genetic stability
(B) Growth and development
(C) Wound healing
(D) Production of gametes

Correct Answer: D

Explanation: Production of gametes is a function of meiosis, not mitosis.

25. The longest phase of meiosis is:

(A) Prophase I
(B) Prophase II
(C) Metaphase I
(D) Telophase II

Correct Answer: A

Explanation: Prophase I is the longest phase of meiosis.

B. Less Important / Secondary Topics

26. During which phase does no DNA replication occur?

(A) Interphase II
(B) Interphase I
(C) Prophase I
(D) S phase

Correct Answer: A

Explanation: There is no further DNA replication during Interphase II.

27. Which of the following is a source of genetic variation in meiosis?

(A) DNA replication
(B) Crossing over

(C) Cytokinesis
(D) Interphase

Correct Answer: B

Explanation: Crossing over and independent assortment are sources of genetic variation in meiosis.

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

Correct Answer: C

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.

29. Which of the following is true about Meiosis II?

(A) It is a reduction division
(B) It involves crossing over
(C) It produces diploid cells
(D) It is similar to mitosis

Correct Answer: D

Explanation: Meiosis II is similar to mitosis and separates sister chromatids.

30. The stage of mitosis where chromosomes are pulled to opposite poles is:

(A) Anaphase
(B) Prophase
(C) Metaphase
(D) Telophase

Correct Answer: A

Explanation: In anaphase, chromatids are pulled to opposite poles.

31. The process by which a cell divides into two daughter cells is called:

(A) Meiosis
(B) Mitosis
(C) Fertilization
(D) Mutation

Correct Answer: B

Explanation: Mitosis is the cell division that produces two daughter cells.

32. In the context of the cell cycle, G□ refers to:

(A) A phase of active growth
(B) The phase of DNA replication
(C) A resting phase where the cell stops dividing
(D) The phase of nuclear division

Correct Answer: C

Explanation: G□ is a resting phase where the cell exits the cell cycle and stops dividing.

33. Which type of cell division is responsible for asexual reproduction?

(A) Meiosis
(B) Binary fission
(C) Fertilization
(D) Mitosis

Correct Answer: D

Explanation: Mitosis is the basis of asexual reproduction.

34. Which of the following is an example of a cell that can re-enter the cell cycle from G□ when needed?

(A) Liver cell
(B) Neuron
(C) Red blood cell
(D) Muscle cell

Correct Answer: A

Explanation: Cells of the liver and kidneys enter G□ temporarily and can re-enter the cell cycle when needed.

35. Crossing over occurs during:

(A) Mitosis
(B) Meiosis I
(C) Meiosis II
(D) Interphase

Correct Answer: B

Explanation: Crossing over occurs during Meiosis I.

36. A cell has completed meiosis I but meiosis II fails to occur. What will be the result?

(A) Two diploid cells
(B) Four haploid cells
(C) Two haploid cells with sister chromatids still attached
(D) One diploid cell

Correct Answer: C

Explanation: After meiosis I, the cells are haploid (chromosome number reduced by half), but sister chromatids remain attached until meiosis II separates them. If meiosis II fails, the result is two haploid cells with sister chromatids still attached.

37. A student observes a cell under the microscope. The chromosomes are aligned at the equator, and spindle fibres are attached to the centromeres. Which phase of mitosis is this?

(A) Prophase
(B) Anaphase
(C) Telophase
(D) Metaphase

Correct Answer: D

Explanation: In metaphase, chromosomes are aligned at the equator of the spindle, and spindle fibres attach to the centromeres.

38. Why is crossing over important for evolution?

(A) It creates genetic variation
(B) It reduces the chromosome number
(C) It increases the rate of mitosis
(D) It prevents mutations

Correct Answer: A

Explanation: Crossing over creates new combinations of genes, which is a source of genetic variation necessary for evolution.

39. Which of the following best explains why cancer cells divide excessively?

(A) They lack a nucleus
(B) They have a faulty cell cycle control system
(C) They have more chromosomes than normal cells
(D) They lack mitochondria

Correct Answer: B

Explanation: Cancer cells do not have a proper functioning cell cycle control system and therefore divide excessively.

40. During which phase of meiosis do homologous chromosomes separate?

(A) Prophase I
(B) Metaphase I

(C) Anaphase I
(D) Telophase I

Correct Answer: C

Explanation: Anaphase I — this correctly answers the question.

41. A cell that has 46 chromosomes undergoes meiosis. How many chromosomes will each daughter cell have?

(A) 46
(B) 92
(C) 12
(D) 23

Correct Answer: D

Explanation: Meiosis halves the chromosome number. A cell with 46 chromosomes will produce daughter cells with 23 chromosomes.

42. Which of the following statements about the spindle apparatus is correct?

(A) It separates chromatids or chromosomes during cell division
(B) It is permanent and present throughout the cell cycle
(C) It is found only in plant cells
(D) It is made of microfilaments

Correct Answer: A

Explanation: It separates chromatids or chromosomes during cell division — this correctly answers the question.

43. In plant cells, cytokinesis involves the formation of a cell plate from:

(A) Microtubules
(B) Golgi vesicles
(C) Ribosomes
(D) Lysosomes

Correct Answer: B

Explanation: In plant cells, Golgi apparatus forms vesicles that appear in the centre of the phragmoplast and form the middle lamella and primary walls of daughter cells.

44. Which of the following best explains why meiosis is important for sexual reproduction?

(A) It produces genetically identical cells
(B) It increases the chromosome number
(C) It maintains the chromosome number across generations
(D) It prevents fertilization

Correct Answer: C

Explanation: It maintains the chromosome number across generations — this correctly answers the question.

45. A cell has 8 chromosomes. After meiosis, how many chromosomes will each daughter cell have?

(A) 8
(B) 16
(C) 2
(D) 4

Correct Answer: D

Explanation: Meiosis halves the chromosome number. A cell with 8 chromosomes will produce daughter cells with 4 chromosomes.

46. Which of the following statements about mitosis is correct?

(A) It is involved in growth and repair
(B) It produces four daughter cells
(C) It halves the chromosome number
(D) It produces gametes

Correct Answer: A

Explanation: Mitosis is involved in growth, repair, and asexual reproduction. It produces two daughter cells with the same chromosome number.

47. The stage of meiosis where crossing over occurs is:

(A) Metaphase I
(B) Prophase I
(C) Anaphase I
(D) Telophase I

Correct Answer: B

Explanation: The stage of meiosis where crossing over occurs is Prophase I.

48. Which of the following is a key difference between mitosis and meiosis?

(A) Mitosis occurs in germ line cells; meiosis occurs in somatic cells
(B) Mitosis produces haploid cells; meiosis produces diploid cells
(C) Mitosis involves one division; meiosis involves two divisions
(D) Mitosis involves crossing over; meiosis does not

Correct Answer: C

Explanation: Mitosis involves one division; meiosis involves two divisions — this correctly answers the question.

49. A cell that has 40 chromosomes undergoes mitosis. How many chromosomes will each daughter cell have?

(A) 20
(B) 80
(C) 10
(D) 40

Correct Answer: D

Explanation: Mitosis maintains the chromosome number. A cell with 40 chromosomes will produce daughter cells with 40 chromosomes.

50. Which of the following best explains why the offspring produced by meiosis are genetically different from each other?

(A) Crossing over and independent assortment create genetic variation
(B) Meiosis produces identical cells
(C) Meiosis does not involve DNA replication
(D) Meiosis produces diploid cells

Correct Answer: A

Explanation: Crossing over and independent assortment create genetic variation — this correctly answers the question.

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Biology Grade 9 — Chapter 5

Tissues, Organs and Organ Systems

by Public Library

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

A. Important / Main Topics

1. The levels of organization from smallest to largest are:

(A) Atoms → Molecules → Organelles → Cells → Tissues → Organs → Organ systems → Organism
(B) Cells → Tissues → Organs → Organ systems → Organism
(C) Organism → Organs → Tissues → Cells → Organelles
(D) Molecules → Atoms → Tissues → Cells → Organ systems

Correct Answer: A

Explanation: The text lists the levels of organization as atomic, molecular, organelle, cellular, tissue, organ, organ system, and organism.

2. A group of cells with similar functions is called a:

(A) Organ
(B) Tissue
(C) Organ system
(D) Molecule

Correct Answer: B

Explanation: Tissues are groups of cells with similar functions.

3. Organs are structures made up of:

(A) One type of tissue
(B) Only cells
(C) Two or more types of tissues
(D) Only organelles

Correct Answer: C

Explanation: Organs are made up of two or more types of tissues organized to carry out a particular function.

4. The tendency to maintain a stable, relatively constant internal environment is called:

(A) Metabolism
(B) Evolution
(C) Respiration
(D) Homeostasis

Correct Answer: D

Explanation: Homeostasis is the tendency to maintain a s.

5. Which plant tissue covers and protects the plant?

(A) Dermal tissue
(B) Ground tissue
(C) Vascular tissue
(D) Connective tissue

Correct Answer: A

Explanation: Dermal tissue — this correctly answers the question.

6. Which plant tissue serves as a site for photosynthesis, storage, and support?

(A) Dermal tissue
(B) Ground tissue
(C) Vascular tissue
(D) Nervous tissue

Correct Answer: B

Explanation: Ground tissue serves as a site for photosynthesis, storage, and support.

7. Xylem and phloem are examples of:

(A) Dermal tissue
(B) Ground tissue
(C) Vascular tissue
(D) Connective tissue

Correct Answer: C

Explanation: Xylem and phloem are the two types of vascular tissue, responsible for transport.

8. Which of the following is a type of animal tissue?

(A) Dermal
(B) Ground
(C) Vascular
(D) Epithelial

Correct Answer: D

Explanation: The four main types of animal tissues are epithelial, connective, muscular, and nervous tissue.

9. Which animal tissue covers and lines body surfaces?

(A) Epithelial tissue
(B) Connective tissue
(C) Muscular tissue
(D) Nervous tissue

Correct Answer: A

Explanation: Epithelial tissue — this correctly answers the question.

10. Tendon, bone, and fat are examples of:

(A) Epithelial tissue
(B) Connective tissue
(C) Muscular tissue
(D) Nervous tissue

Correct Answer: B

Explanation: Tendon, bone, and fat are examples of connective tissue.

11. Which tissue is specialized for movement?

(A) Epithelial
(B) Connective
(C) Muscular
(D) Nervous

Correct Answer: C

Explanation: Muscular tissue is specialized for contraction and relaxation, enabling movement.

12. Nervous tissue is found in:

(A) Tendons
(B) Skin surface
(C) Fat
(D) Brain, spinal cord, and nerves

Correct Answer: D

Explanation: Nervous tissue is found in the brain, spinal cord, and nerves.

13. Which of the following is a vegetative part of the shoot system?

(A) Leaves
(B) Flowers
(C) Fruits
(D) Seeds

Correct Answer: A

Explanation: Leaves — this correctly answers the question.

14. The root system is usually:

(A) Above ground
(B) Underground
(C) On the surface
(D) Inside the leaf

Correct Answer: B

Explanation: The root system is usually underground.

15. Which of the following is a function of the root system?

(A) Photosynthesis
(B) Producing flowers
(C) Anchoring the plant
(D) Absorbing light

Correct Answer: C

Explanation: The root system anchors the plant into the ground, absorbs water and minerals, and serves as a storage site for food.

16. At which level of organization do organs first appear?

(A) Cellular level
(B) Tissue level
(C) Organ system level
(D) Organ level

Correct Answer: D

Explanation: Organs are structures made up of two or more tissues, so the organ level comes after the tissue level.

17. Which of the following organs pumps blood?

(A) Heart
(B) Lungs
(C) Stomach
(D) Kidneys

Correct Answer: A

Explanation: Heart — this correctly answers the question.

18. Which organ system includes the nose, mouth, pharynx, larynx, trachea, and lungs?

(A) Cardiovascular system
(B) Respiratory system
(C) Digestive system
(D) Nervous system

Correct Answer: B

Explanation: Respiratory system — this correctly answers the question.

19. The respiratory system and the circulatory system work together to:

(A) Digest food
(B) Produce hormones
(C) Deliver oxygen to cells and remove carbon dioxide
(D) Filter waste

Correct Answer: C

Explanation: The respiratory system and the circulatory system work together to Deliver oxygen to cells and remove carbon dioxide.

20. The temperature-regulatory control centre in the brain is the:

(A) Cerebrum
(B) Cerebellum

(C) Medulla
(D) Hypothalamus

Correct Answer: D

Explanation: The hypothalamus is the temperature regulation centre in the brain.

21. When body temperature rises, which of the following is an effector activated to cool the body?

(A) Sweat glands
(B) Muscles
(C) Kidneys
(D) Liver

Correct Answer: A

Explanation: Sweat glands are effectors activated to cool the body.

22. Which organ system maintains tissue fluid homeostasis?

(A) Cardiovascular
(B) Lymphatic
(C) Digestive
(D) Endocrine

Correct Answer: B

Explanation: Lymphatic — this correctly answers the question.

23. Which organ system helps in temperature regulation by heat production?

(A) Cardiovascular
(B) Digestive
(C) Muscular
(D) Integumentary

Correct Answer: C

Explanation: Muscular — this correctly answers the question.

24. Which of the following is NOT a function of the leaf?

(A) Photosynthesis
(B) Transpiration
(C) Transferring synthesized food
(D) Anchoring the plant

Correct Answer: D

Explanation: Anchoring the plant is a function of the root system, not the leaf.

25. The epidermis of a leaf is covered by a waxy substance called:

(A) Cutin
(B) Chitin
(C) Cellulose
(D) Lignin

Correct Answer: A

Explanation: A waxy substance called cutin, which forms the cuticle, covers the upper epidermis.

B. Less Important / Secondary Topics

26. Stomata are enclosed by:

(A) Guard cells
(B) Xylem cells
(C) Phloem cells
(D) Mesophyll cells

Correct Answer: A

Explanation: Each stoma is enclosed by two guard cells.

27. The palisade mesophyll consists of:

(A) Loosely arranged irregular cells
(B) Two or three layers of cylindrical cells with many chloroplasts
(C) Dead cells
(D) Cells without chloroplasts

Correct Answer: B

Explanation: The palisade mesophyll consists of two or three layers of cylindrical cells with many chloroplasts.

28. Which tissue transports water from the roots to the leaves?

(A) Phloem
(B) Dermal tissue
(C) Xylem
(D) Ground tissue

Correct Answer: C

Explanation: Xylem transports water and minerals from the roots to the leaves.

29. Which of the following is a reproductive part of the shoot system?

(A) Leaves
(B) Stems
(C) Roots
(D) Flowers

Correct Answer: D

Explanation: Flowers — this correctly answers the question.

30. Most organs contain how many tissue types?

(A) Four
(B) One
(C) Two
(D) Three

Correct Answer: A

Explanation: Four — this correctly answers the question.

31. Which of the following is an example of an organ?

(A) Muscle tissue
(B) Heart
(C) Neuron
(D) Ribosome

Correct Answer: B

Explanation: Heart — this correctly answers the question.

32. Which organ provides a barrier to protect internal structures from the external environment?

(A) Heart
(B) Lungs
(C) Skin
(D) Stomach

Correct Answer: C

Explanation: The skin provides a barrier to protect internal structures from the external environment.

33. Which of the following is a function of the lungs?

(A) Pumping blood
(B) Digesting food
(C) Filtering waste
(D) Bringing in oxygen and eliminating carbon dioxide

Correct Answer: D

Explanation: Bringing in oxygen and eliminating carbon dioxide — this correctly answers the question.

34. Which of the following correctly describes the relationship between structure and function at the organ level?

(A) Structure is closely related to function
(B) Structure is unrelated to function
(C) Only cells have structure-function relationships
(D) Only organ systems have structure-function relationships

Correct Answer: A

Explanation: At each level of organization, structure is closely related to function.

35. Which plant organ system is generally above ground?

(A) Root system
(B) Shoot system
(C) Vascular system
(D) Dermal system

Correct Answer: B

Explanation: The shoot system generally grows above ground, where it absorbs the light needed for photosynthesis.

36. A scientist discovers a new multicellular organism. It has cells with nuclei, no cell walls, and the ability to move. To which kingdom does it most likely belong?

(A) Plantae
(B) Fungi
(C) Animalia
(D) Protista

Correct Answer: C

Explanation: Animalia — this correctly answers the question.

37. Which of the following best explains why the respiratory and circulatory systems must work together?

(A) They both produce hormones
(B) They both digest food
(C) They both filter waste
(D) Neither system alone can exchange gases between cells and the environment

Correct Answer: D

Explanation: Only when both systems are working together can oxygen and carbon dioxide be successfully exchanged between cells and the environment.

38. A person is exercising vigorously. Which homeostatic response is most likely to occur?

(A) Increased sweating and increased blood flow to the skin
(B) Decreased blood flow to the skin
(C) Decreased breathing rate
(D) Decreased body temperature

Correct Answer: A

Explanation: Increased sweating and increased blood flow to the skin — this correctly answers the question.

39. Which of the following correctly matches an organ system with its role in homeostasis?

(A) Cardiovascular — maintains tissue fluid homeostasis
(B) Digestive — maintains blood nutrient levels
(C) Lymphatic — stabilizes gases, wastes, temperature, and pH
(D) Endocrine — provides protection from injury

Correct Answer: B

Explanation: Digestive — maintains blood nutrient levels — this correctly answers the question.

40. Which of the following is an example of a tissue?

(A) Heart
(B) Human

(C) Muscle tissue
(D) Stomach

Correct Answer: C

Explanation: Muscle tissue is an example of a tissue (a group of cells with similar functions).

41. A student examines a leaf under the microscope. Which of the following structures would be present for gas exchange?

(A) Xylem
(B) Phloem
(C) Cuticle
(D) Stomata

Correct Answer: D

Explanation: Stomata are tiny pores on the lower epidermis that allow the exchange of oxygen and carbon dioxide with the environment.

42. Which of the following best explains why plant cells can become turgid while animal cells cannot?

(A) Plant cells have a rigid cell wall; animal cells lack a cell wall
(B) Plant cells have a nucleus; animal cells do not
(C) Plant cells have chloroplasts; animal cells do not
(D) Plant cells have mitochondria; animal cells do not

Correct Answer: A

Explanation: Plant cells can become turgid due to the presence of a cell wall, which allows plant parts to maintain structure and stay upright. Animal cells lack a cell wall and cannot become turgid.

43. Which of the following statements about the shoot system is correct?

(A) It is generally underground
(B) It includes leaves, stems, flowers, and fruits
(C) It consists only of reproductive parts
(D) It anchors the plant

Correct Answer: B

Explanation: It includes leaves, stems, flowers, and fruits — this correctly answers the question.

44. Which of the following correctly describes the role of guard cells?

(A) They transport water
(B) They perform photosynthesis
(C) They regulate the opening and closing of stomata
(D) They store food

Correct Answer: C

Explanation: They regulate the opening and closing of stomata — this correctly answers the question.

45. A scientist is studying a tissue that covers and lines body surfaces and organs. Which tissue type is this?

(A) Connective tissue
(B) Muscular tissue
(C) Nervous tissue
(D) Epithelial tissue

Correct Answer: D

Explanation: Epithelial tissue — this correctly answers the question.

46. Which of the following best explains why most organs contain all four tissue types?

(A) To perform complex functions requiring different cell activities
(B) To increase their size
(C) To reduce their weight
(D) To prevent disease

Correct Answer: A

Explanation: Most organs contain all four tissue types, which work together to perform specific functions.

47. Which of the following is a function of the endocrine system?

(A) Transport of oxygen
(B) Maintaining balance of many blood components like glucose, water, and calcium
(C) Providing physical defence against infection
(D) Producing movement

Correct Answer: B

Explanation: Maintaining balance of many blood components like glucose, water, and calcium — this correctly answers the question.

48. Which of the following statements about the levels of organization is correct?

(A) Tissues are made of organs
(B) Organs are made of organ systems
(C) Organ systems are made of organs
(D) Cells are made of tissues

Correct Answer: C

Explanation: Organ systems are groups of organs that perform related functions.

49. Which of the following is a function of the integumentary system?

(A) Transport of nutrients
(B) Production of hormones
(C) Digestion of food
(D) Protection from injury and fluid loss

Correct Answer: D

Explanation: The integumentary system provides protection from injury and fluid loss and provides physical defence against infection by microorganisms.

50. Which of the following best describes the relationship between the respiratory and circulatory systems?

(A) They work together to exchange gases between cells and the environment
(B) They work independently
(C) They compete for resources
(D) They have no interaction

Correct Answer: A

Explanation: The respiratory and circulatory systems work closely together to deliver oxygen to cells and remove carbon dioxide. Only when both systems are working together can gas exchange occur successfully. Answer.

Biology Grade 9 — Chapter 6

Molecular Biology

by Public Library

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

A. Important / Main Topics

1. Biochemistry is the study of:

(A) Chemical compounds and chemical processes within living organisms
(B) Only the physical structure of organisms
(C) Only the classification of organisms
(D) Only the behavior of animals

Correct Answer: A

Explanation: Biochemistry is the study of different chemical compounds and the chemical processes taking place within the living organisms.

2. How many naturally occurring elements are bioelements?

(A) 92
(B) 16
(C) 6
(D) 10

Correct Answer: B

Explanation: Out of 92 naturally occurring elements on Earth, 16 are bioelements.

3. Which of the following is a major bioelement?

(A) Iron
(B) Zinc
(C) Carbon
(D) Copper

Correct Answer: C

Explanation: Carbon is one of the six major bioelements.

4. Proteins are polymers of:

(A) Nucleotides
(B) Monosaccharides
(C) Fatty acids
(D) Amino acids

Correct Answer: D

Explanation: Proteins are polypeptide chains which are polymers of amino acids.

5. The bond between two amino acids is called a:

(A) Peptide bond
(B) Glycosidic bond
(C) Phosphodiester bond
(D) Hydrogen bond

Correct Answer: A

Explanation: The bond between two amino acids is called a peptide bond.

6. How many different types of amino acids are commonly found in proteins?

(A) 5–10
(B) 20–25
(C) 50–60
(D) 100–120

Correct Answer: B

Explanation: There are about 20–25 different types of amino acids commonly found in proteins.

7. Lipids are:

(A) Hydrophilic
(B) Soluble in water
(C) Hydrophobic
(D) Soluble in acids only

Correct Answer: C

Explanation: Lipids are hydrophobic in nature (insoluble in water).

8. One gram of lipids provides how much energy?

(A) 4 kcal
(B) 2 kcal
(C) 12 kcal
(D) 9.1 kcal

Correct Answer: D

Explanation: 9.1 kcal — this correctly answers the question.

9. Carbohydrates are composed of carbon, hydrogen, and oxygen in a ratio of:

(A) 1:2:1
(B) 1:1:1
(C) 2:1:2
(D) 1:2:3

Correct Answer: A

Explanation: Carbohydrates are composed of carbon, hydrogen, and oxygen in a ratio of 1:2:1.

10. The building blocks of nucleic acids are:

(A) Amino acids
(B) Nucleotides
(C) Monosaccharides
(D) Fatty acids

Correct Answer: B

Explanation: Nucleic acids are made up of many units called nucleotides.

11. Which sugar is found in DNA?

(A) Ribose
(B) Glucose
(C) Deoxyribose
(D) Fructose

Correct Answer: C

Explanation: Deoxyribose — this correctly answers the question.

12. Which base is found in RNA but not in DNA?

(A) Thymine
(B) Guanine
(C) Cytosine
(D) Uracil

Correct Answer: D

Explanation: Uracil — this correctly answers the question.

13. A small piece of DNA on a chromosome that stores hereditary information is called a:

(A) Gene
(B) Nucleotide
(C) Genome
(D) Codon

Correct Answer: A

Explanation: A gene is a small piece of a huge DNA molecule in the chromosome.

14. Which type of RNA carries the message of DNA from the nucleus to the cytoplasm?

(A) tRNA
(B) mRNA
(C) rRNA
(D) siRNA

Correct Answer: B

Explanation: Messenger RNA (mRNA) carries the message of DNA from the nucleus to the cytoplasm.

15. The flow of information from DNA to RNA to protein is called the:

(A) Transcription
(B) Translation
(C) Central dogma
(D) Replication

Correct Answer: C

Explanation: The flow of biological information from DNA to RNA and from RNA to protein is known as the central dogma.

16. Which of the following is a role of proteins in the body?

(A) Store genetic information
(B) Form cell walls in plants
(C) Provide long-term energy storage
(D) Act as enzymes

Correct Answer: D

Explanation: Most enzymes are proteins which control biochemical reactions.

17. One gram of protein provides how much energy?

(A) 4 kcal
(B) 2 kcal
(C) 9 kcal
(D) 12 kcal

Correct Answer: A

Explanation: 4 kcal — this correctly answers the question.

18. Saturated fatty acids are:

(A) Liquid at room temperature
(B) Solid at room temperature
(C) Gases at room temperature
(D) Always unsaturated

Correct Answer: B

Explanation: Saturated fatty acids have all C-C single bonds and are solid at room temperature.

19. Tri-acyl glycerides contain:

(A) One glycerol and one fatty acid
(B) One glycerol and two fatty acids
(C) One glycerol and three fatty acids
(D) Three glycerol and one fatty acid

Correct Answer: C

Explanation: Tri-acyl glycerides contain One glycerol and three fatty acids.

20. Sucrose is formed by the condensation of:

(A) Glucose and galactose
(B) Galactose and fructose
(C) Glucose and glucose

(D) Glucose and fructose

Correct Answer: D

Explanation: Sucrose is formed by the condensation of glucose and fructose.

21. Lactose is formed by the condensation of:

(A) Galactose and glucose
(B) Glucose and fructose
(C) Glucose and glucose
(D) Fructose and galactose

Correct Answer: A

Explanation: Lactose is formed by the condensation of galactose and glucose.

22. Which polysaccharide makes the exoskeleton of arthropods?

(A) Cellulose
(B) Chitin
(C) Starch
(D) Glycogen

Correct Answer: B

Explanation: Chitin — this correctly answers the question.

23. According to the Watson and Crick model, how many hydrogen bonds are between adenine and thymine?

(A) One
(B) Three
(C) Two
(D) Four

Correct Answer: C

Explanation: There are two hydrogen bonds between adenine and thymine.

24. The diameter of the DNA double helix is about:

(A) 1 nm
(B) 3 nm
(C) 4 nm
(D) 2 nm

Correct Answer: D

Explanation: The diameter of the double helix of DNA is about 2 nm.

25. Which type of RNA is a component of ribosomes?

(A) rRNA
(B) mRNA
(C) tRNA
(D) None of the above

Correct Answer: A

Explanation: Ribosomal RNA (rRNA) is a component of ribosomes.

B. Less Important / Secondary Topics

26. Which of the following is a plant source of protein?

(A) Lentils
(B) Milk
(C) Beef
(D) Fish

Correct Answer: A

Explanation: Lentils are a plant source of protein.

27. Which of the following is a minor bioelement?

(A) Oxygen
(B) Iron
(C) Carbon
(D) Hydrogen

Correct Answer: B

Explanation: Iron is one of the ten minor bioelements.

28. The remaining ten bioelements constitute what percentage of biomolecules?

(A) 99%
(B) 50%
(C) 1%
(D) 10%

Correct Answer: C

Explanation: 1% — this correctly answers the question.

29. Which of the following is an example of a carbohydrate?

(A) Hemoglobin
(B) Cholesterol
(C) DNA
(D) Glucose

Correct Answer: D

Explanation: Glucose — this correctly answers the question.

30. The α-carbon of an amino acid is attached to all of the following EXCEPT:

(A) Phosphate group (-PO□)
(B) Hydrogen atom (-H)
(C) Amino group (-NH□)
(D) Carboxyl group (-COOH)

Correct Answer: A

Explanation: The α-carbon of an amino acid is attached to a hydrogen atom, an amino group, a carboxyl group, and an R group. A phosphate group is not attached to the α-carbon.

31. Which of the following is a function of the Golgi apparatus?

(A) Producing ATP
(B) Modifying and packaging materials into vesicles
(C) Synthesizing proteins
(D) Digesting waste

Correct Answer: B

Explanation: Modifying and packaging materials into vesicles — this correctly answers the question.

32. Which of the following is a role of RNA?

(A) Store genetic information
(B) Form cell walls
(C) Act as a tool for translation
(D) Provide long-term energy storage

Correct Answer: C

Explanation: RNA functions as tools for translation and protein synthesis.

33. Which of the following is an example of a steroid?

(A) Glucose
(B) Cellulose
(C) Hemoglobin
(D) Cholesterol

Correct Answer: D

Explanation: Cholesterol — this correctly answers the question.

34. Which of the following is a function of carbohydrates?

(A) Provide energy
(B) Store genetic information
(C) Act as enzymes
(D) Transport oxygen

Correct Answer: A

Explanation: Carbohydrates are the major source of useable and stored energy in cells.

35. Which of the following is a non-polar, hydrophobic molecule?

(A) Glucose
(B) Lipid
(C) Amino acid
(D) Nucleotide

Correct Answer: B

Explanation: Lipids are hydrophobic (water-fearing) molecules.

36. A scientist discovers a new biomolecule that is hydrophobic, has a glycerol backbone, and contains three fatty acid chains. What type of biomolecule is this?

(A) Protein
(B) Carbohydrate
(C) Tri-acyl glyceride (triglyceride)
(D) Nucleic acid

Correct Answer: C

Explanation: Tri-acyl glycerides (triglycerides) contain one glycerol and three fatty acids. They are lipids and are hydrophobic.

37. Which of the following correctly distinguishes DNA from RNA?

(A) DNA is single-stranded; RNA is double-stranded
(B) DNA contains ribose; RNA contains deoxyribose
(C) DNA is found in the cytoplasm; RNA is found in the nucleus
(D) DNA contains thymine; RNA contains uracil

Correct Answer: D

Explanation: DNA contains thymine; RNA contains uracil — this correctly answers the question.

38. A protein has a specific number, type, and sequence of amino acids. This describes its:

(A) Primary structure
(B) Secondary structure
(C) Tertiary structure
(D) Quaternary structure

Correct Answer: A

Explanation: A linear polypeptide with a specific number, type, and sequence of amino acids is called the primary structure.

39. Which of the following is an example of a protein?

(A) Glucose
(B) Hemoglobin
(C) Cholesterol
(D) Cellulose

Correct Answer: B

Explanation: Hemoglobin is an example of a protein.

40. Which of the following correctly matches a biomolecule with its location in the cell?

(A) Carbohydrates — nucleus
(B) Lipids — nucleolus
(C) Proteins — rough endoplasmic reticulum

(D) DNA — cytoplasm

Correct Answer: C

Explanation: Proteins are located in the cytoplasm, rough endoplasmic reticulum, and Golgi bodies.

41. Which of the following is a function of lipids?

(A) Store genetic information
(B) Act as enzymes
(C) Synthesize proteins
(D) Provide long-term energy storage

Correct Answer: D

Explanation: Lipids provide cells with long-term energy and are a component of cell membranes.

42. Which of the following statements about the DNA double helix is correct?

(A) The two strands are antiparallel
(B) The two strands are parallel
(C) The two strands are identical
(D) The two strands are made of protein

Correct Answer: A

Explanation: Both strands of the DNA molecule are antiparallel (oppositely oriented to each other).

43. Which of the following is a function of rRNA?

(A) Carries the genetic message from DNA
(B) Combines with ribosomal proteins to form ribosomes
(C) Transfers amino acids to ribosomes
(D) Stores genetic information

Correct Answer: B

Explanation: Ribosomal RNA (rRNA) combines with ribosomal protein to form units of ribosomes, which are the factory of proteins.

44. A mutation changes the sequence of nucleotides in DN

(A) What effect could this have on the protein produced? A. No effect at all
(B) It would immediately stop all cell functions
(C) It could change the sequence of amino acids in the protein
(D) It would change the protein into a lipid

Correct Answer: C

Explanation: The correct primary structure of any protein is primarily determined by DNA. A mutation in DNA could change the sequence of amino acids in the protein.

45. Which of the following correctly describes the process of transcription?

(A) DNA → DNA
(B) RNA → Protein
(C) Protein → RNA
(D) DNA → RNA

Correct Answer: D

Explanation: Transcription is the first step of gene expression that involves the formation of an RNA molecule from DNA.

46. Which of the following correctly describes the process of translation?

(A) RNA → Protein
(B) DNA → DNA
(C) DNA → RNA
(D) Protein → RNA

Correct Answer: A

Explanation: Translation is the process in which the mRNA message is translated by ribosomes to form a polypeptide chain (protein).

47. Which of the following is a function of carbohydrates?

(A) Store genetic information
(B) Provide structural material for cell walls
(C) Act as enzymes
(D) Transport oxygen

Correct Answer: B

Explanation: Carbohydrates are structural material for the cell walls of plants (cellulose), fungi (chitin), and bacteria (peptidoglycan).

48. Which of the following statements about enzymes is correct?

(A) All enzymes are carbohydrates
(B) All enzymes are lipids
(C) Most enzymes are proteins
(D) Enzymes are nucleic acids

Correct Answer: C

Explanation: Most of the enzymes are proteins which control biochemical reactions.

49. Which of the following is a function of DNA?

(A) Act as a tool for translation
(B) Provide long-term energy storage
(C) Speed up chemical reactions
(D) Store and pass on genetic information

Correct Answer: D

Explanation: DNA is a component of chromosomes and stores and passes on genetic information.

50. Which of the following correctly matches a biomolecule with its role?

(A) Lipids — component of cell membranes
(B) Carbohydrates — genetic information
(C) Proteins — energy storage
(D) Nucleic acids — structural material for cell walls

Correct Answer: A

Explanation: Phospholipids and cholesterol are components of plasma membrane structure. Lipids are a component of cell membranes. Answer.

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Biology Grade 9 — Chapter 7

Metabolism

by Public Library

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

A. Important / Main Topics

1. The sum of all chemical reactions within a cell is called:

(A) Metabolism
(B) Catabolism
(C) Anabolism
(D) Digestion

Correct Answer: A

Explanation: Metabolism is the sum of all chemical reactions within a cell.

2. Which of the following is a catabolic process?

(A) Photosynthesis
(B) Cellular respiration
(C) Glycogen synthesis
(D) Protein synthesis

Correct Answer: B

Explanation: Cellular respiration is a catabolic process (breaks down glucose).

3. Enzymes are:

(A) Carbohydrates
(B) Lipids
(C) Globular proteins
(D) Nucleic acids

Correct Answer: C

Explanation: Enzymes are biologically active globular proteins (few are RNA).

4. The molecules on which enzymes act are called:

(A) Products
(B) Cofactors
(C) Activators
(D) Substrates

Correct Answer: D

Explanation: Substrates are the molecules entering into chemical reactions that bind to enzymes.

5. The specific part of the enzyme where the substrate binds is called the:

(A) Active site
(B) Allosteric site
(C) Inhibitor site
(D) Cofactor site

Correct Answer: A

Explanation: The active site is where the substrate binds and takes part in the reaction.

6. The complex formed when the substrate binds to the enzyme is called the:

(A) Enzyme-Product complex
(B) Enzyme-Substrate complex
(C) Enzyme-Inhibitor complex
(D) Enzyme-Cofactor complex

Correct Answer: B

Explanation: The Enzyme-Substrate (ES) complex is formed when the substrate binds to the active site.

7. The optimum temperature for human enzymes is:

(A) 20–25°C
(B) 30–32°C
(C) 36–38°C
(D) 40–45°C

Correct Answer: C

Explanation: The optimum temperature for human enzymes is 36°C to 38°C.

8. What happens to an enzyme at very high temperature?

(A) It becomes more active
(B) It becomes inactive but can recover
(C) It changes into a substrate
(D) It denatures

Correct Answer: D

Explanation: It denatures — this correctly answers the question.

9. The optimum pH for pepsin is:

(A) 2.00
(B) 7.00
(C) 8.00
(D) 10.00

Correct Answer: A

Explanation: The optimum pH for pepsin is 2.00.

10. The optimum pH for trypsin is:

(A) 2.00
(B) 8.00
(C) 7.00
(D) 10.00

Correct Answer: B

Explanation: The optimum pH for trypsin is 8.00.

11. The phenomenon where enzymes are not able to perform their role due to interfering chemicals is called:

(A) Enzyme activation
(B) Enzyme denaturation
(C) Enzyme inhibition
(D) Enzyme synthesis

Correct Answer: C

Explanation: Enzyme inhibition occurs when chemicals interfere with enzyme.

12. The chemical substance that inhibits an enzyme is called an:

(A) Activator
(B) Cofactor
(C) Substrate
(D) Inhibitor

Correct Answer: D

Explanation: An inhibitor is a chemical substance that inhibits enzyme action.

13. ATP stands for:

(A) Adenosine Triphosphate
(B) Adenosine Diphosphate
(C) Adenine Triphosphate
(D) Adenosine Monophosphate

Correct Answer: A

Explanation: ATP stands for Adenosine Triphosphate.

14. ATP is commonly called the:

(A) Building block of proteins
(B) Energy currency of the cell
(C) Genetic material
(D) Structural component of cell walls

Correct Answer: B

Explanation: ATP is called the energy currency of the cell.

15. The conversion of ATP to ADP and inorganic phosphate is called:

(A) Condensation
(B) Oxidation
(C) Hydrolysis
(D) Reduction

Correct Answer: C

Explanation: ATP is converted to ADP and inorganic phosphate by hydrolysis.

16. Which of the following is an anabolic process?

(A) Digestion
(B) Cellular respiration
(C) Glycolysis
(D) Photosynthesis

Correct Answer: D

Explanation: Photosynthesis is an anabolic process (builds glucose from CO□ and H□O).

17. In which type of metabolism is energy released?

(A) Catabolism
(B) Anabolism
(C) Both
(D) Neither

Correct Answer: A

Explanation: Energy is usually released in catabolism.

18. In which type of metabolism is energy utilized?

(A) Catabolism
(B) Anabolism
(C) Both
(D) Neither

Correct Answer: B

Explanation: Energy is usually utilized in anabolism.

19. The word metabolism means:

(A) To build
(B) To break
(C) To change
(D) To release

Correct Answer: C

Explanation: The word metabolism means to change.

20. Digestion is an example of:

(A) Anabolism
(B) Both
(C) Neither
(D) Catabolism

Correct Answer: D

Explanation: Digestion is a catabolic process (breaks down food).

21. The condensation of glucose molecules to form glycogen is an example of:

(A) Anabolism
(B) Catabolism
(C) Digestion
(D) Respiration

Correct Answer: A

Explanation: Glycogen synthesis is an anabolic process.

22. Which of the following is a biochemical reaction?

(A) Rusting of iron
(B) Digestion of food
(C) Burning of wood
(D) Melting of ice

Correct Answer: B

Explanation: Digestion of food is a biochemical reaction (occurs in living organisms).

23. The energy released in catabolism is used in:

(A) Digestion
(B) Respiration
(C) Anabolism
(D) Excretion

Correct Answer: C

Explanation: The energy released in catabolism is utilized in anabolism.

24. Which of the following is NOT a characteristic of enzymes?

(A) They increase the rate of reaction
(B) They are specific
(C) They lower activation energy
(D) They are required in large quantities

Correct Answer: D

Explanation: Enzymes are required in small quantities because they are reusable.

25. Which of the following is an example of an intracellular enzyme?

(A) Glycolysis enzymes
(B) Pepsin
(C) Amylase in saliva
(D) Trypsin

Correct Answer: A

Explanation: Glycolysis enzymes work in the cytoplasm (intracellular). Pepsin, salivary amylase, and trypsin are extracellular.

B. Less Important / Secondary Topics

26. Enzymes that are RNA in nature are called:

(A) Ribozymes
(B) Coenzymes
(C) Prosthetic groups
(D) Activators

Correct Answer: A

Explanation: Few enzymes are RNA in nature called ribozymes.

27. The activity of salivary amylase is increased by the presence of:

(A) Zinc ions

(B) Chloride ions
(C) Iron ions
(D) Copper ions

Correct Answer: B

Explanation: The activity of salivary amylase is increased by the presence of Chloride ions.

28. A tightly and permanently attached organic cofactor is called a:

(A) Coenzyme
(B) Activator
(C) Prosthetic group
(D) Substrate

Correct Answer: C

Explanation: A prosthetic group is an organic molecule tightly and permanently attached to the enzyme.

29. NAD and coenzyme A are examples of:

(A) Prosthetic groups
(B) Activators
(C) Substrates
(D) Coenzymes

Correct Answer: D

Explanation: NAD and coenzyme A are coenzymes (detachable organic molecules).

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

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

Correct Answer: A

Explanation: The energy of activation is the minimum extra energy required to start a reaction.

31. A series of connected chemical reactions where multiple intermediate molecules are produced is called a:

(A) Reaction chain
(B) Metabolic pathway
(C) Cofactor cycle
(D) Enzyme complex

Correct Answer: B

Explanation: A metabolic pathway is a series of connected chemical reactions with intermediate molecules.

32. In competitive inhibition, the inhibitor:

(A) Binds to the allosteric site
(B) Denatures the enzyme permanently
(C) Resembles the substrate and binds to the active site
(D) Increases the reaction rate

Correct Answer: C

Explanation: In competitive inhibition, the inhibitor Resembles the substrate and binds to the active site.

33. Competitive inhibition can be reversed by:

(A) Decreasing substrate concentration
(B) Adding more inhibitor
(C) Changing the pH
(D) Increasing substrate concentration

Correct Answer: D

Explanation: Competitive inhibition can be reversed if the concentration of the actual substrate is increased.

34. In non-competitive inhibition, the inhibitor binds to the:

(A) Allosteric site
(B) Active site
(C) Substrate
(D) Product

Correct Answer: A

Explanation: In non-competitive inhibition, the inhibitor binds to the Allosteric site.

35. Which of the following is an internal source of enzyme inhibition?

(A) Cyanide
(B) Accumulated products
(C) Antibiotics
(D) Poisons

Correct Answer: B

Explanation: Accumulated products — this correctly answers the question.

36. A student adds a competitive inhibitor to an enzyme-catalyzed reaction. Which of the following would be the most effective way to restore the reaction rate?

(A) Add more inhibitor
(B) Decrease the temperature
(C) Increase the substrate concentration
(D) Change the pH

Correct Answer: C

Explanation: Competitive inhibition is temporary and can be reversed if the concentration of the actual substrate is increased than the concentration of inhibitor molecules.

37. A non-competitive inhibitor binds to an enzyme. What happens to the enzyme's active site?

(A) It remains unchanged
(B) It becomes more active
(C) It is converted into a product
(D) It is altered, preventing the substrate from binding

Correct Answer: D

Explanation: Non-competitive inhibitors alter the globular shape of the enzyme and damage the active site, so the substrate cannot bind.

38. Which of the following best explains why enzymes are specific?

(A) Their active site has a specific shape and charge that complements only certain substrates
(B) They have a rigid structure that cannot change
(C) They are found only in specific organs
(D) They require cofactors

Correct Answer: A

Explanation: Enzymes are specific because the active site is a charge-bearing cavity having a specific shape that complements only specific substrates.

39. Which of the following is a living characteristic of ATP?

(A) It can be crystallized
(B) It stores and releases energy
(C) It lacks cellular structure
(D) It does not respire

Correct Answer: B

Explanation: ATP is an energy-rich compound that can store and release energy and can be used much like money.

40. The structure of ATP includes all of the following EXCEPT:

(A) Adenine
(B) Ribose
(C) Deoxyribose
(D) Three phosphate groups

Correct Answer: C

Explanation: The structure of ATP includes all of the following EXCEPT Deoxyribose.

41. Which of the following correctly describes the ATP-ADP cycle?

(A) ATP → ADP + Pi (condensation); ADP + Pi → ATP (hydrolysis)
(B) ATP → AMP + Pi (hydrolysis); AMP + Pi → ATP (condensation)
(C) ATP → Adenine + Ribose (hydrolysis)
(D) ATP → ADP + Pi + Energy (hydrolysis); ADP + Pi + Energy → ATP (condensation)

Correct Answer: D

Explanation: ATP is converted to ADP and inorganic phosphate by hydrolysis (releasing energy). ADP and phosphate are converted back to ATP by condensation (storing energy).

42. Which of the following is a function of ATP in cells?

(A) Powering muscle contraction
(B) Storing genetic information
(C) Forming cell walls
(D) Synthesizing lipids

Correct Answer: A

Explanation: Powering muscle contraction — this correctly answers the question.

43. Which of the following correctly matches a factor with its effect on enzyme activity?

(A) High temperature — increases activity indefinitely
(B) Extreme pH — denatures the enzyme
(C) Low temperature — permanently denatures the enzyme
(D) Substrate concentration — always increases the rate indefinitely

Correct Answer: B

Explanation: Extreme pH — denatures the enzyme — this correctly answers the question.

44. A cell is placed in a solution with a pH of 2.0. Which enzyme would be most active in this environment?

(A) Trypsin
(B) Salivary amylase
(C) Pepsin
(D) Catalase

Correct Answer: C

Explanation: Pepsin — this correctly answers the question.

45. Which of the following best explains why enzymes are reusable?

(A) They are consumed in the reaction
(B) They are produced in large quantities
(C) They are not specific
(D) They remain unchanged at the end of the reaction

Correct Answer: D

Explanation: The structure of enzymes may slightly change during a reaction, but they regain their actual shape, so they remain unchanged at the end and can be used repeatedly.

46. In the mechanism of enzyme action, what happens after the Enzyme-Product (EP) complex forms?

(A) The EP complex breaks up into products and the enzyme
(B) The enzyme is destroyed
(C) The substrate re-binds to the enzyme
(D) The enzyme becomes a substrate

Correct Answer: A

Explanation: Finally, the EP complex breaks up into products and the enzyme, and the enzyme is available again if needed for the same reaction.

47. Which of the following is a characteristic of a coenzyme?

(A) It is tightly bound to the enzyme
(B) It is a detachable organic molecule
(C) It is an inorganic ion
(D) It is a protein

Correct Answer: B

Explanation: If the cofactor is a detachable organic molecule, it is called a coenzyme.

48. Which of the following best explains why the reaction rate plateaus at high substrate concentration?

(A) The enzyme denatures
(B) The substrate becomes inactive
(C) All active sites are occupied
(D) The pH changes

Correct Answer: C

Explanation: At high substrate concentration, all active sites of the enzyme molecules are occupied, so adding more substrate has no effect.

49. Which of the following is an example of an external source of enzyme inhibition?

(A) Accumulated products
(B) Substrate
(C) Cofactor
(D) Cyanide

Correct Answer: D

Explanation: Cyanide — this correctly answers the question.

50. Which of the following statements about ATP is correct?

(A) It is a short-term energy carrier
(B) It is a long-term energy storage molecule
(C) It is a structural component of cell walls
(D) It is a genetic material

Correct Answer: A

Explanation: ATP is a short-term energy carrier; long-term energy is stored in molecules like glycogen, starch, and fats. Answer.

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Biology Grade 9 — Chapter 8

Plant Physiology

by Public Library

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

A. Important / Main Topics

1. Any substance that provides necessary elements to the organism for growth and metabolism is called a:

(A) Nutrient
(B) Hormone
(C) Enzyme
(D) Vitamin

Correct Answer: A

Explanation: Any substance that provides necessary elements to the organism for growth and metabolism is called a nutrient.

2. How many elements have been found essential for plant growth?

(A) 9
(B) 16
(C) 7
(D) 12

Correct Answer: B

Explanation: Sixteen elements have been found essential for plant growth.

3. Which of the following is a macronutrient?

(A) Iron
(B) Zinc
(C) Magnesium
(D) Copper

Correct Answer: C

Explanation: Magnesium is a macronutrient. Iron, zinc, and copper are micronutrients.

4. Which of the following is a micronutrient?

(A) Nitrogen
(B) Phosphorus
(C) Calcium
(D) Boron

Correct Answer: D

Explanation: Boron is a micronutrient. Nitrogen, phosphorus, and calcium are macronutrients.

5. Nitrogen is mainly absorbed by plants in the form of:

(A) Nitrates (NO□□)
(B) N□ gas
(C) Ammonia (NH□)
(D) Amino acids

Correct Answer: A

Explanation: Nitrogen is mainly absorbed by plants from soil through roots in the form of inorganic nitrogenous compounds like nitrates (NO□□).

6. Magnesium is essential for the formation of:

(A) Proteins
(B) Chlorophyll

(C) Carbohydrates
(D) Lipids

Correct Answer: B

Explanation: Magnesium is used to make chlorophyll.

7. What is chlorosis?

(A) Wilting of leaves
(B) Curling of leaves
(C) Yellowing of leaves
(D) Dropping of leaves

Correct Answer: C

Explanation: Chlorosis is the yellowing of plant leaves due to deficiency of minerals.

8. Water is absorbed by roots through:

(A) Active transport
(B) Facilitated diffusion
(C) Bulk flow
(D) Osmosis

Correct Answer: D

Explanation: Water is absorbed by osmosis, a passive transport mechanism.

9. Approximately what percentage of absorbed water is lost through transpiration?

(A) 99%
(B) 50%
(C) 75%
(D) 90%

Correct Answer: A

Explanation: About 99% of absorbed water is lost through transpiration.

10. Most transpiration occurs through:

(A) Lenticels
(B) Stomata
(C) Cuticle
(D) Root hairs

Correct Answer: B

Explanation: Most transpiration occurs through Stomata.

11. The TACT theory explains:

(A) Translocation
(B) Photosynthesis
(C) Ascent of sap
(D) Respiration

Correct Answer: C

Explanation: The TACT theory explains Ascent of sap.

12. In the TACT theory, "A" stands for:

(A) Absorption
(B) Active transport
(C) Ascent
(D) Adhesion

Correct Answer: D

Explanation: A stands for Adhesion (attraction between water molecules and xylem walls).

13. Translocation occurs through:

(A) Phloem
(B) Xylem

(C) Cambium
(D) Epidermis

Correct Answer: A

Explanation: Translocation is the transport of organic solutes through phloem.

14. In translocation, food moves from:

(A) Sink to source
(B) Source to sink
(C) Root to leaf only
(D) Leaf to root only

Correct Answer: B

Explanation: Translocation moves from a source (where food is produced) to a sink (where food is used or stored).

15. The pressure flow theory explains:

(A) Water absorption
(B) Transpiration
(C) Translocation
(D) Ascent of sap

Correct Answer: C

Explanation: The pressure flow theory explains Translocation.

16. Which of the following is an ecological importance of biodiversity?

(A) Providing building materials
(B) Providing medicines
(C) Providing fibres for clothing
(D) Helping the carbon cycle

Correct Answer: D

Explanation: Helping the carbon cycle is an ecological importance. The others are economic importance.

17. How many macronutrients are essential for plant growth?

(A) 9
(B) 7
(C) 16
(D) 5

Correct Answer: A

Explanation: 9 — this correctly answers the question.

18. How many micronutrients are essential for plant growth?

(A) 9
(B) 7
(C) 16
(D) 5

Correct Answer: B

Explanation: 7 — this correctly answers the question.

19. Which of the following is a role of nitrogen in plants?

(A) Formation of chlorophyll
(B) Protein synthesis
(C) Both A and B
(D) Neither A nor B

Correct Answer: C

Explanation: Nitrogen is used to make amino acids (for protein synthesis), nucleotides, and chlorophyll.

20. What is the major source of magnesium in the soil?

(A) Nitrogen fertilizers
(B) Dolomitic limestone

(C) Magnesium sulphate
(D) Decomposition of dead plant debris

Correct Answer: D

Explanation: The major source of magnesium in the soil is the decomposition of dead plant debris.

21. The main function of the spindle apparatus is to:

(A) Separate chromatids or chromosomes and move them to opposite poles
(B) Synthesize proteins
(C) Produce energy
(D) Digest waste

Correct Answer: A

Explanation: The main function of the spindle apparatus is to Separate chromatids or chromosomes and move them to opposite poles.

22. Which cells remain in G□ permanently?

(A) Liver cells
(B) Neurons
(C) Kidney cells
(D) Epithelial cells

Correct Answer: B

Explanation: Neurons — this correctly answers the question.

23. During which phase does the cell grow in size and increase its organelles?

(A) S phase
(B) G□ phase
(C) G□ phase
(D) M phase

Correct Answer: C

Explanation: G□ phase — this correctly answers the question.

24. Which of the following is true about Meiosis II?

(A) It is a reduction division
(B) It involves crossing over
(C) It produces diploid cells
(D) It is similar to mitosis

Correct Answer: D

Explanation: Meiosis II is similar to mitosis and separates sister chromatids.

25. The longest phase of meiosis is:

(A) Prophase I
(B) Prophase II
(C) Metaphase I
(D) Telophase II

Correct Answer: A

Explanation: Prophase I is the longest phase of meiosis.

B. Less Important / Secondary Topics

26. During which phase does no DNA replication occur?

(A) Interphase II
(B) Interphase I
(C) Prophase I
(D) S phase

Correct Answer: A

Explanation: There is no further DNA replication during Interphase II.

27. Which of the following is a source of genetic variation in meiosis?

(A) DNA replication
(B) Crossing over
(C) Cytokinesis
(D) Interphase

Correct Answer: B

Explanation: Crossing over and independent assortment are sources of genetic variation in meiosis.

28. The stage of mitosis where chromosomes are pulled to opposite poles is:

(A) Prophase
(B) Metaphase
(C) Anaphase
(D) Telophase

Correct Answer: C

Explanation: In anaphase, chromatids are pulled to opposite poles.

29. In animal cells, cytokinesis occurs by the formation of a:

(A) Cell plate
(B) Phragmoplast
(C) Middle lamella
(D) Cleavage furrow

Correct Answer: D

Explanation: In animal cells, the cell membrane invaginates to form a cleavage furrow that separates the two daughter cells.

30. Which type of plastid is responsible for photosynthesis?

(A) Chloroplast
(B) Chromoplast
(C) Leucoplast
(D) Tonoplast

Correct Answer: A

Explanation: Chloroplast — this correctly answers the question.

31. Which of the following is a function of the cell wall in plants?

(A) Synthesizing proteins
(B) Providing support and shape
(C) Producing ATP
(D) Digesting waste

Correct Answer: B

Explanation: The cell wall supports the structure of individual cells and the plant as a whole. It protects and gives shape to the cell.

32. Which of the following is a modified epidermal cell that regulates the opening and closing of stomata?

(A) Root hair cell
(B) Mesophyll cell
(C) Guard cell
(D) Neuron

Correct Answer: C

Explanation: Guard cell — this correctly answers the question.

33. The average age of red blood cells is:

(A) 30 days
(B) 60 days
(C) 180 days

(D) 120 days

Correct Answer: D

Explanation: The average age of RBCs is 120 days.

34. Why do red blood cells lack a nucleus and mitochondria?

(A) To accommodate more haemoglobin
(B) To help them divide faster
(C) To store more water
(D) To produce more ATP

Correct Answer: A

Explanation: The absence of a nucleus, mitochondria, and endoplasmic reticulum in RBCs helps to accommodate more haemoglobin, which is necessary for oxygen transport.

35. Which of the following is a function of the Golgi apparatus?

(A) Producing ATP
(B) Modifying and packaging materials into vesicles
(C) Synthesizing proteins
(D) Digesting waste

Correct Answer: B

Explanation: Modifying and packaging materials into vesicles — this correctly answers the question.

36. A scientist discovers a new unicellular organism that has a nucleus, is aquatic, and moves using pseudopodi

(A) To which kingdom does it most likely belong? A. Monera
(B) Fungi
(C) Protista
(D) Animalia

Correct Answer: C

Explanation: "Protista" is correct: it matches the idea asked in the question ("A scientist discovers a new unicellular organism that has a nucleus, is aquatic, and moves using pseudopodi"), while the other choices do not.

37. Which of the following best explains why the two-kingdom system was replaced?

(A) It had too many kingdoms
(B) It was too complicated
(C) It did not include bacteria
(D) Organisms like Euglena had both plant-like and animal-like characteristics

Correct Answer: D

Explanation: Euglena has chlorophyll (plant-like) and heterotrophic nutrition in darkness with no cell wall (animal-like), making the two-kingdom system inadequate.

38. Which of the following correctly distinguishes Archaea from Bacteria?

(A) Archaea lack peptidoglycan in their cell walls; Bacteria have peptidoglycan
(B) Archaea are eukaryotic; Bacteria are prokaryotic
(C) Archaea are multicellular; Bacteria are unicellular
(D) Archaea are sensitive to traditional antibacterial antibiotics; Bacteria are not

Correct Answer: A

Explanation: Archaea lack peptidoglycan in their cell walls; Bacteria have peptidoglycan — this correctly answers the question.

39. A scientist is classifying a newly discovered organism. It is multicellular, autotrophic, has cellulose in its cell wall, and contains chloroplasts. To which kingdom does it belong?

(A) Protista
(B) Plantae
(C) Fungi
(D) Animalia

Correct Answer: B

Explanation: Members of kingdom Plantae are eukaryotic, multicellular, and autotrophic with chloroplasts containing chlorophyll. Their cell wall is made up of cellulose.

40. Which of the following statements about viruses is correct?

(A) They are included in the kingdom Monera
(B) They are classified in the domain Archaea
(C) They are not included in any domain or kingdom
(D) They are classified as fungi

Correct Answer: C

Explanation: Because viruses are at the borderline of living and non-living, they are not included in any domain or kingdom under modern classification.

41. A person is exercising vigorously. Which homeostatic response is most likely to occur?

(A) Decreased blood flow to the skin
(B) Decreased breathing rate
(C) Decreased body temperature
(D) Increased sweating and increased blood flow to the skin

Correct Answer: D

Explanation: Increased sweating and increased blood flow to the skin — this correctly answers the question.

42. Which of the following correctly matches an organ system with its role in homeostasis?

(A) Digestive — maintains blood nutrient levels
(B) Cardiovascular — maintains tissue fluid homeostasis
(C) Lymphatic — stabilizes gases, wastes, temperature, and pH
(D) Endocrine — provides protection from injury

Correct Answer: A

Explanation: Digestive — maintains blood nutrient levels — this correctly answers the question.

43. A student examines a leaf under the microscope. Which of the following structures would be present for gas exchange?

(A) Xylem
(B) Stomata
(C) Phloem
(D) Cuticle

Correct Answer: B

Explanation: Stomata are tiny pores on the lower epidermis that allow the exchange of oxygen and carbon dioxide with the environment.

44. Which of the following best explains why plant cells can become turgid while animal cells cannot?

(A) Plant cells have a nucleus; animal cells do not
(B) Plant cells have chloroplasts; animal cells do not
(C) Plant cells have a rigid cell wall; animal cells lack a cell wall
(D) Plant cells have mitochondria; animal cells do not

Correct Answer: C

Explanation: Plant cells can become turgid due to the presence of a cell wall, which allows plant parts to maintain structure and stay upright. Animal cells lack a cell wall and cannot become turgid.

45. Which of the following statements about the shoot system is correct?

(A) It is generally underground
(B) It consists only of reproductive parts
(C) It anchors the plant
(D) It includes leaves, stems, flowers, and fruits

Correct Answer: D

Explanation: It includes leaves, stems, flowers, and fruits — this correctly answers the question.

46. Which of the following correctly describes the role of guard cells?

(A) They regulate the opening and closing of stomata
(B) They transport water
(C) They perform photosynthesis
(D) They store food

Correct Answer: A

Explanation: They regulate the opening and closing of stomata — this correctly answers the question.

47. A scientist is studying a tissue that covers and lines body surfaces and organs. Which tissue type is this?

(A) Connective tissue
(B) Epithelial tissue
(C) Muscular tissue
(D) Nervous tissue

Correct Answer: B

Explanation: Epithelial tissue — this correctly answers the question.

48. Which of the following best explains why most organs contain all four tissue types?

(A) To increase their size
(B) To reduce their weight
(C) To perform complex functions requiring different cell activities
(D) To prevent disease

Correct Answer: C

Explanation: Most organs contain all four tissue types, which work together to perform specific functions.

49. Which of the following is a function of the endocrine system?

(A) Transport of oxygen
(B) Providing physical defence against infection
(C) Producing movement
(D) Maintaining balance of many blood components like glucose, water, and calcium

Correct Answer: D

Explanation: Maintaining balance of many blood components like glucose, water, and calcium — this correctly answers the question.

50. Which of the following statements about the levels of organization is correct?

(A) Organ systems are made of organs
(B) Tissues are made of organs
(C) Organs are made of organ systems
(D) Cells are made of tissues

Correct Answer: A

Explanation: Organ systems are groups of organs that perform related functions. Answer.

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Biology Grade 9 — Chapter 9

Plant Reproduction

by Public Library

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

A. Important / Main Topics

1. Asexual reproduction produces offspring that are:

(A) Clones of the parent
(B) Genetically diverse
(C) Always male
(D) Always female

Correct Answer: A

Explanation: Asexual reproduction produces clones, which are genetically identical to the parent.

2. Which of the following is NOT a method of asexual reproduction?

(A) Binary fission
(B) Meiosis
(C) Budding
(D) Spore formation

Correct Answer: B

Explanation: Meiosis is involved in sexual reproduction, not asexual reproduction.

3. Binary fission is commonly used by:

(A) True plants
(B) Fungi
(C) Bacteria and protozoa
(D) Animals

Correct Answer: C

Explanation: Binary fission is used by bacteria and protozoa; no true plant uses this process.

4. In yeast, budding involves the splitting of the nucleus by:

(A) Meiosis
(B) Binary fission
(C) Fertilization
(D) Mitosis

Correct Answer: D

Explanation: In yeast, budding involves the splitting of the nucleus by Mitosis.

5. In higher plants, vegetative buds give rise to:

(A) New branches and leaves
(B) Flowers
(C) Fruits
(D) Seeds

Correct Answer: A

Explanation: In higher plants, vegetative buds give rise to New branches and leaves.

6. Spores in Rhizopus are produced in:

(A) Gametangia
(B) Sporangia
(C) Nodules
(D) Roots

Correct Answer: B

Explanation: Spores in Rhizopus are produced in sporangia on sporangiophores.

7. Which of the following is NOT considered part of asexual reproduction?

(A) Parthenogenesis
(B) Vegetative propagation
(C) Spores produced by meiosis in bryophytes
(D) Binary fission

Correct Answer: C

Explanation: Spores produced by meiosis in bryophytes are part of the sexual life cycle, not asexual reproduction.

8. Parthenogenesis in plants is also known as:

(A) Fertilization
(B) Pollination
(C) Budding
(D) Apomixis

Correct Answer: D

Explanation: Parthenogenesis in plants is also known as apomixis.

9. Vegetative propagation can be:

(A) Natural or artificial
(B) Only natural
(C) Only artificial
(D) Only sexual

Correct Answer: A

Explanation: Vegetative propagation can be natural (plants do it on their own) or artificial (humans help).

10. Which of the following organisms reproduces by budding?

(A) Rhizopus
(B) Yeast
(C) Bacteria
(D) Fern

Correct Answer: B

Explanation: Yeast — this correctly answers the question.

11. Bulbs are enveloped by:

(A) Scales
(B) Bark
(C) Fleshy leaves
(D) Roots

Correct Answer: C

Explanation: Bulbs are enveloped by thick, succulent (fleshy) leaves.

12. Which of the following is an example of a corm?

(A) Onion
(B) Potato
(C) Strawberry
(D) Garlic

Correct Answer: D

Explanation: Garlic — this correctly answers the question.

13. Rhizomes are:

(A) Horizontal underground stems
(B) Above-ground stems
(C) Swollen root tips
(D) Small outgrowths

Correct Answer: A

Explanation: Rhizomes are flat, horizontal underground stems.

14. Which plant reproduces by stem tubers?

(A) Ginger
(B) Potato
(C) Onion
(D) Strawberry

Correct Answer: B

Explanation: Potato is an example of a stem tuber.

15. Strawberries reproduce by:

(A) Bulbs
(B) Corms
(C) Runners
(D) Suckers

Correct Answer: C

Explanation: Strawberries reproduce by Runners.

16. The male reproductive part of a flower is the:

(A) Calyx
(B) Corolla
(C) Gynoecium
(D) Androecium

Correct Answer: D

Explanation: The androecium (stamens) is the male reproductive part.

17. The female reproductive part of a flower is the:

(A) Gynoecium
(B) Calyx
(C) Corolla
(D) Androecium

Correct Answer: A

Explanation: The gynoecium (carpels) is the female reproductive part.

18. Pollen grains are produced in the:

(A) Ovule
(B) Anther
(C) Stigma
(D) Style

Correct Answer: B

Explanation: Pollen grains are produced in the anther.

19. Megaspores are produced in the:

(A) Anther
(B) Stigma
(C) Ovule
(D) Filament

Correct Answer: C

Explanation: Megaspores are produced in the ovule.

20. The transfer of pollen from anther to stigma is called:

(A) Fertilization
(B) Germination
(C) Double fertilization
(D) Pollination

Correct Answer: D

Explanation: Pollination is the transfer of pollen from anther to stigma.

21. The fusion of one sperm nucleus with the egg forms the:

(A) Zygote
(B) Endosperm nucleus
(C) Polar nuclei
(D) Synergids

Correct Answer: A

Explanation: The fusion of one sperm nucleus with the egg forms the zygote.

22. Double fertilization is unique to:

(A) Bryophytes
(B) Angiosperms
(C) Pteridophytes
(D) Gymnosperms

Correct Answer: B

Explanation: Double fertilization is unique to angiosperms (flowering plants).

23. After fertilization, the ovule becomes the:

(A) Fruit
(B) Flower
(C) Seed
(D) Embryo

Correct Answer: C

Explanation: After fertilization, the ovule becomes the Seed.

24. In epigeal germination, the cotyledons are:

(A) Underground
(B) Absent
(C) Photosynthetic
(D) Above ground

Correct Answer: D

Explanation: In epigeal germination, the cotyledons are Above ground.

25. The best temperature for most seeds to germinate is:

(A) 25–30°C
(B) 10–15°C
(C) 35–40°C
(D) 0–5°C

Correct Answer: A

Explanation: For most plants, the best temperature for germination is between 25–30°C.

B. Less Important / Secondary Topics

26. Which of the following is an artificial method of vegetative propagation?

(A) Grafting
(B) Bulbs
(C) Rhizomes
(D) Runners

Correct Answer: A

Explanation: Grafting is an artificial method; the others are natural.

27. The part of the plant used for artificial vegetative propagation is called a:

(A) Seed
(B) Vegetative propagule
(C) Gamete

(D) Spore

Correct Answer: B

Explanation: The part used is called a vegetative propagule.

28. Stem cuttings must have at least one:

(A) Leaf
(B) Flower
(C) Node
(D) Root

Correct Answer: C

Explanation: Stem cuttings must have at least one node.

29. Which hormone is used to stimulate growth in stem cuttings?

(A) Insulin
(B) Adrenaline
(C) Thyroxine
(D) Auxin

Correct Answer: D

Explanation: Auxin is a plant hormone used to stimulate growth in cuttings.

30. In grafting, the upper part of the plant is called the:

(A) Scion
(B) Rootstock
(C) Explant
(D) Callus

Correct Answer: A

Explanation: In grafting, the upper part of the plant is called the Scion.

31. In grafting, the lower part of the plant is called the:

(A) Scion
(B) Rootstock
(C) Explant
(D) Callus

Correct Answer: B

Explanation: In grafting, the lower part of the plant is called the Rootstock.

32. Cloning in plants is also called:

(A) Grafting
(B) Stem cutting
(C) Tissue culturing
(D) Budding

Correct Answer: C

Explanation: Cloning in plants is also called tissue culturing or micropropagation.

33. The initial piece of plant tissue used in tissue culture is called an:

(A) Callus
(B) Scion
(C) Rootstock
(D) Explant

Correct Answer: D

Explanation: The initial piece is called an explant.

34. The undifferentiated mass of cells formed in tissue culture is called a:

(A) Callus
(B) Plantlet
(C) Scion

(D) Explant

Correct Answer: A

Explanation: The undifferentiated mass is called a callus.

35. Which of the following is an example of a plant propagated by stem cuttings?

(A) Apple
(B) Rose
(C) Potato
(D) Onion

Correct Answer: B

Explanation: Roses are commonly propagated by stem cuttings.

36. A scientist discovers a new unicellular organism that has a nucleus, is aquatic, and moves using pseudopodi

(A) To which kingdom does it most likely belong? A. Monera
(B) Fungi
(C) Protista
(D) Animalia

Correct Answer: C

Explanation: "Protista" is correct: it matches the idea asked in the question ("A scientist discovers a new unicellular organism that has a nucleus, is aquatic, and moves using pseudopodi"), while the other choices do not.

37. Which of the following best explains why the two-kingdom system was replaced?

(A) It had too many kingdoms
(B) It was too complicated
(C) It did not include bacteria
(D) Organisms like Euglena had both plant-like and animal-like characteristics

Correct Answer: D

Explanation: Euglena has chlorophyll (plant-like) and heterotrophic nutrition in darkness with no cell wall (animal-like), making the two-kingdom system inadequate.

38. Which of the following correctly distinguishes Archaea from Bacteria?

(A) Archaea lack peptidoglycan in their cell walls; Bacteria have peptidoglycan
(B) Archaea are eukaryotic; Bacteria are prokaryotic
(C) Archaea are multicellular; Bacteria are unicellular
(D) Archaea are sensitive to traditional antibacterial antibiotics; Bacteria are not

Correct Answer: A

Explanation: Archaea lack peptidoglycan in their cell walls; Bacteria have peptidoglycan — this correctly answers the question.

39. A scientist is classifying a newly discovered organism. It is multicellular, autotrophic, has cellulose in its cell wall, and contains chloroplasts. To which kingdom does it belong?

(A) Protista
(B) Plantae
(C) Fungi
(D) Animalia

Correct Answer: B

Explanation: Members of kingdom Plantae are eukaryotic, multicellular, and autotrophic with chloroplasts containing chlorophyll. Their cell wall is made up of cellulose.

40. Which of the following statements about viruses is correct?

(A) They are included in the kingdom Monera
(B) They are classified in the domain Archaea
(C) They are not included in any domain or kingdom
(D) They are classified as fungi

Correct Answer: C

Explanation: Because viruses are at the borderline of living and non-living, they are not included in any domain or kingdom under modern classification.

41. A person is exercising vigorously. Which homeostatic response is most likely to occur?

(A) Decreased blood flow to the skin
(B) Decreased breathing rate
(C) Decreased body temperature
(D) Increased sweating and increased blood flow to the skin

Correct Answer: D

Explanation: Increased sweating and increased blood flow to the skin — this correctly answers the question.

42. Which of the following correctly matches an organ system with its role in homeostasis?

(A) Digestive — maintains blood nutrient levels
(B) Cardiovascular — maintains tissue fluid homeostasis
(C) Lymphatic — stabilizes gases, wastes, temperature, and pH
(D) Endocrine — provides protection from injury

Correct Answer: A

Explanation: Digestive — maintains blood nutrient levels — this correctly answers the question.

43. A student examines a leaf under the microscope. Which of the following structures would be present for gas exchange?

(A) Xylem
(B) Stomata
(C) Phloem
(D) Cuticle

Correct Answer: B

Explanation: Stomata are tiny pores on the lower epidermis that allow the exchange of oxygen and carbon dioxide with the environment.

44. Which of the following best explains why plant cells can become turgid while animal cells cannot?

(A) Plant cells have a nucleus; animal cells do not
(B) Plant cells have chloroplasts; animal cells do not
(C) Plant cells have a rigid cell wall; animal cells lack a cell wall
(D) Plant cells have mitochondria; animal cells do not

Correct Answer: C

Explanation: Plant cells can become turgid due to the presence of a cell wall, which allows plant parts to maintain structure and stay upright. Animal cells lack a cell wall and cannot become turgid.

45. Which of the following statements about the shoot system is correct?

(A) It is generally underground
(B) It consists only of reproductive parts
(C) It anchors the plant
(D) It includes leaves, stems, flowers, and fruits

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Explanation: It includes leaves, stems, flowers, and fruits — this correctly answers the question.

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(A) They regulate the opening and closing of stomata
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(D) Nervous tissue

Correct Answer: B

Explanation: Epithelial tissue — this correctly answers the question.

48. Which of the following best explains why most organs contain all four tissue types?

(A) To increase their size
(B) To reduce their weight
(C) To perform complex functions requiring different cell activities
(D) To prevent disease

Correct Answer: C

Explanation: Most organs contain all four tissue types, which work together to perform specific functions.

49. Which of the following is a function of the endocrine system?

(A) Transport of oxygen
(B) Providing physical defence against infection
(C) Producing movement
(D) Maintaining balance of many blood components like glucose, water, and calcium

Correct Answer: D

Explanation: Maintaining balance of many blood components like glucose, water, and calcium — this correctly answers the question.

50. Which of the following statements about the levels of organization is correct?

(A) Organ systems are made of organs
(B) Tissues are made of organs
(C) Organs are made of organ systems
(D) Cells are made of tissues

Correct Answer: A

Explanation: Organ systems are groups of organs that perform related functions. Answer.

Biology Grade 9 — Chapter 10

Evolution

by Public Library

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

A. Important / Main Topics

1. The differences in traits displayed by members of the same species are called:

(A) Variation
(B) Adaptation
(C) Evolution
(D) Mutation

Correct Answer: A

Explanation: Variation refers to differences in traits among members of the same species.

2. According to scientists, the Earth is more than:

(A) 4 million years old
(B) 4 billion years old
(C) 4 trillion years old
(D) 4 thousand years old

Correct Answer: B

Explanation: The Earth is more than four billion years old.

3. Evolution is defined as:

(A) The sudden appearance of new traits
(B) The extinction of a species
(C) The gradual alteration of a population's traits over time
(D) The migration of a species

Correct Answer: C

Explanation: Evolution is the gradual alteration of a population's or species' traits over time.

4. An inherited trait that increases an organism's chances of survival is called:

(A) Variation
(B) Mutation
(C) Gene flow
(D) Adaptation

Correct Answer: D

Explanation: An adaptation is an inherited trait that increases survival chances.

5. Who proposed the theory of natural selection?

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

Correct Answer: A

Explanation: Charles Darwin — this correctly answers the question.

6. Darwin made his observations during a voyage on the ship:

(A) Endeavour
(B) Beagle
(C) Victoria
(D) Santa Maria

Correct Answer: B

Explanation: Darwin made his observations during a voyage on the ship Beagle.

7. Darwin published "On the Origin of Species" in:

(A) 1838
(B) 1848
(C) 1859
(D) 1895

Correct Answer: C

Explanation: Darwin published "On the Origin of Species" in 1859.

8. The evolutionary process by which new biological species arise is called:

(A) Variation
(B) Adaptation
(C) Natural selection
(D) Speciation

Correct Answer: D

Explanation: Speciation is the evolutionary process by which new species arise.

9. Speciation typically begins when a species is split into:

(A) Two geographical regions
(B) Two different climates
(C) Two different diets
(D) Two different sizes

Correct Answer: A

Explanation: Speciation starts when a species gets split into two geographical regions.

10. The inability of two groups to interbreed and produce fertile offspring is called:

(A) Geographical isolation
(B) Reproductive isolation
(C) Adaptation
(D) Divergence

Correct Answer: B

Explanation: Reproductive isolation is the inability to interbreed and produce fertile offspring.

11. Which of the following is evidence from palaeontology?

(A) Homologous structures
(B) Selective breeding
(C) Fossil record
(D) Vestigial organs

Correct Answer: C

Explanation: The fossil record is evidence from palaeontology.

12. Structures with the same basic shape due to common ancestry are called:

(A) Vestigial organs
(B) Analogous structures
(C) Artificial structures
(D) Homologous structures

Correct Answer: D

Explanation: Structures with the same basic shape due to common ancestry are called Homologous structures.

13. The wings of flightless birds are an example of:

(A) Vestigial organs
(B) Homologous structures
(C) Artificial selection
(D) Fossil record

Correct Answer: A

Explanation: Wings on flightless birds are vestigial organs (non-functional remnants).

14. The practice of breeding plants and animals for desired genetic features is called:

(A) Natural selection
(B) Artificial selection
(C) Mutation
(D) Adaptation

Correct Answer: B

Explanation: Artificial selection (selective breeding) is the practice of breeding for desired traits.

15. The human appendix is an example of:

(A) A homologous structure
(B) An adaptation
(C) A vestigial organ
(D) A fossil

Correct Answer: C

Explanation: The appendix is a vestigial organ (non-functional remnant).

16. Which of the following is a source of variation?

(A) Crossing over
(B) Independent assortment
(C) Mutation
(D) All of the above

Correct Answer: D

Explanation: Crossing over, independent assortment, and mutation are all sources of variation.

17. Which of the following is a source of variation?

(A) All of the above
(B) Gene flow
(C) Fertilization
(D) Mutation

Correct Answer: A

Explanation: Gene flow, fertilization, and mutation are all sources of variation.

18. New life forms developed from:

(A) Multicellular organisms
(B) Unicellular organisms
(C) Non-living matter
(D) Fossils

Correct Answer: B

Explanation: New life forms developed from unicellular organisms.

19. The process by which individuals with advantageous traits survive and reproduce is called:

(A) Variation
(B) Mutation
(C) Natural selection
(D) Gene flow

Correct Answer: C

Explanation: Natural selection is the process by which individuals with advantageous traits survive and reproduce.

20. Members of a species compete for:

(A) Resources
(B) Mates
(C) Food and water
(D) All of the above

Correct Answer: D

Explanation: Members of a species compete for resources, mates, food, and water.

21. Evolutionary changes can be:

(A) Passed on to next generations
(B) Lost over time
(C) Reversed immediately
(D) Stopped by competition

Correct Answer: A

Explanation: Evolutionary changes can be passed on to next generations.

22. Natural selection is based on how many principles?

(A) Two
(B) Four
(C) Three
(D) Five

Correct Answer: B

Explanation: The four principles are overproduction, competition, variations, and natural selection.

23. The principle that organisms produce more offspring than can survive is called:

(A) Competition
(B) Variation
(C) Overproduction
(D) Adaptation

Correct Answer: C

Explanation: Overproduction is the principle that living creatures are very fertile and produce many offspring.

24. Darwin observed finches with different beak shapes on the:

(A) Hawaiian Islands
(B) Maldives
(C) Andaman Islands
(D) Galapagos Islands

Correct Answer: D

Explanation: Darwin observed finches with different beak shapes on the Galapagos Islands.

25. Before the Industrial Revolution, most peppered moths were:

(A) Light-coloured
(B) Dark-coloured
(C) Green-coloured
(D) Red-coloured

Correct Answer: A

Explanation: Before 1848, all reported variants of the peppered moth were light-coloured with dark patches.

B. Less Important / Secondary Topics

26. By 1895, what percentage of the peppered moth population was dark-coloured?

(A) 95%
(B) 50%
(C) 75%
(D) 100%

Correct Answer: A

Explanation: 95% — this correctly answers the question.

27. Industrial Melanism in peppered moths was caused by:

(A) Increased light
(B) Industrial pollution
(C) Decreased predators

(D) Increased food

Correct Answer: B

Explanation: Industrial Melanism in peppered moths was caused by Industrial pollution.

28. The peppered moth case study demonstrates that:

(A) Individual moths can change colour
(B) Predators do not affect moth populations
(C) Evolution and natural selection operate on genetic change within a population
(D) Pollution is always beneficial

Correct Answer: C

Explanation: The case study demonstrates that evolution and natural selection operate on the basis of genetic change within a population.

29. In natural selection, which organisms survive?

(A) The largest
(B) The strongest
(C) The oldest
(D) The fittest (best adapted)

Correct Answer: D

Explanation: Natural selection is essentially an elimination process; only the fittest (best adapted) organisms survive.

30. The fossil record shows the evolution of which of the following?

(A) Both humans and horses
(B) Humans
(C) Horses
(D) Neither humans nor horses

Correct Answer: A

Explanation: The text states that researchers have found comprehensive records demonstrating how humans and horses have evolved.

31. Which of the following is an example of a homologous structure?

(A) Wings of a bird and wings of an insect
(B) Forelimbs of a human and forelimbs of a whale
(C) Appendix in humans
(D) Wings of a flightless bird

Correct Answer: B

Explanation: Forelimbs of a human and forelimbs of a whale — this correctly answers the question.

32. Modern corn was developed from a wild ancestor through:

(A) Natural selection
(B) Mutation
(C) Selective breeding
(D) Genetic drift

Correct Answer: C

Explanation: Modern corn was developed from a wild ancestor through Selective breeding.

33. Dog breeds have been produced from the wolf by:

(A) Natural selection
(B) Vestigial evolution
(C) Fossilization
(D) Artificial selection

Correct Answer: D

Explanation: Dog breeds have been produced from the wolf by Artificial selection.

34. Which of the following is a difference between natural and artificial selection?

(A) Natural selection is slower
(B) Natural selection is faster
(C) Artificial selection operates in natural populations
(D) Artificial selection is caused by mutations

Correct Answer: A

Explanation: Natural selection is a slow process (thousands to millions of years), while artificial selection is fast (next generation).

35. Which of the following is a vestigial organ in humans?

(A) Heart
(B) Appendix
(C) Liver
(D) Kidney

Correct Answer: B

Explanation: The appendix is a vestigial organ in humans.

36. A scientist discovers a new unicellular organism that has a nucleus, is aquatic, and moves using pseudopodi

(A) To which kingdom does it most likely belong? A. Monera
(B) Fungi
(C) Protista
(D) Animalia

Correct Answer: C

Explanation: "Protista" is correct: it matches the idea asked in the question ("A scientist discovers a new unicellular organism that has a nucleus, is aquatic, and moves using pseudopodi"), while the other choices do not.

37. Which of the following best explains why the two-kingdom system was replaced?

(A) It had too many kingdoms
(B) It was too complicated
(C) It did not include bacteria
(D) Organisms like Euglena had both plant-like and animal-like characteristics

Correct Answer: D

Explanation: Euglena has chlorophyll (plant-like) and heterotrophic nutrition in darkness with no cell wall (animal-like), making the two-kingdom system inadequate.

38. Which of the following correctly distinguishes Archaea from Bacteria?

(A) Archaea lack peptidoglycan in their cell walls; Bacteria have peptidoglycan
(B) Archaea are eukaryotic; Bacteria are prokaryotic
(C) Archaea are multicellular; Bacteria are unicellular
(D) Archaea are sensitive to traditional antibacterial antibiotics; Bacteria are not

Correct Answer: A

Explanation: Archaea lack peptidoglycan in their cell walls; Bacteria have peptidoglycan — this correctly answers the question.

39. A scientist is classifying a newly discovered organism. It is multicellular, autotrophic, has cellulose in its cell wall, and contains chloroplasts. To which kingdom does it belong?

(A) Protista
(B) Plantae
(C) Fungi
(D) Animalia

Correct Answer: B

Explanation: Members of kingdom Plantae are eukaryotic, multicellular, and autotrophic with chloroplasts containing chlorophyll. Their cell wall is made up of cellulose.

40. Which of the following statements about viruses is correct?

(A) They are included in the kingdom Monera

(B) They are classified in the domain Archaea
(C) They are not included in any domain or kingdom
(D) They are classified as fungi

Correct Answer: C

Explanation: Because viruses are at the borderline of living and non-living, they are not included in any domain or kingdom under modern classification.

41. A person is exercising vigorously. Which homeostatic response is most likely to occur?

(A) Decreased blood flow to the skin
(B) Decreased breathing rate
(C) Decreased body temperature
(D) Increased sweating and increased blood flow to the skin

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(D) Endocrine — provides protection from injury

Correct Answer: A

Explanation: Digestive — maintains blood nutrient levels — this correctly answers the question.

43. A student examines a leaf under the microscope. Which of the following structures would be present for gas exchange?

(A) Xylem
(B) Stomata
(C) Phloem
(D) Cuticle

Correct Answer: B

Explanation: Stomata are tiny pores on the lower epidermis that allow the exchange of oxygen and carbon dioxide with the environment.

44. Which of the following best explains why plant cells can become turgid while animal cells cannot?

(A) Plant cells have a nucleus; animal cells do not
(B) Plant cells have chloroplasts; animal cells do not
(C) Plant cells have a rigid cell wall; animal cells lack a cell wall
(D) Plant cells have mitochondria; animal cells do not

Correct Answer: C

Explanation: Plant cells can become turgid due to the presence of a cell wall, which allows plant parts to maintain structure and stay upright. Animal cells lack a cell wall and cannot become turgid.

45. Which of the following statements about the shoot system is correct?

(A) It is generally underground
(B) It consists only of reproductive parts
(C) It anchors the plant
(D) It includes leaves, stems, flowers, and fruits

Correct Answer: D

Explanation: It includes leaves, stems, flowers, and fruits — this correctly answers the question.

46. Which of the following correctly describes the role of guard cells?

(A) They regulate the opening and closing of stomata
(B) They transport water
(C) They perform photosynthesis
(D) They store food

Correct Answer: A

Explanation: They regulate the opening and closing of stomata — this correctly answers the question.

47. A scientist is studying a tissue that covers and lines body surfaces and organs. Which tissue type is this?

(A) Connective tissue
(B) Epithelial tissue
(C) Muscular tissue
(D) Nervous tissue

Correct Answer: B

Explanation: Epithelial tissue — this correctly answers the question.

48. Which of the following best explains why most organs contain all four tissue types?

(A) To increase their size
(B) To reduce their weight
(C) To perform complex functions requiring different cell activities
(D) To prevent disease

Correct Answer: C

Explanation: Most organs contain all four tissue types, which work together to perform specific functions.

49. Which of the following is a function of the endocrine system?

(A) Transport of oxygen
(B) Providing physical defence against infection
(C) Producing movement
(D) Maintaining balance of many blood components like glucose, water, and calcium

Correct Answer: D

Explanation: Maintaining balance of many blood components like glucose, water, and calcium — this correctly answers the question.

50. Which of the following statements about the levels of organization is correct?

(A) Organ systems are made of organs
(B) Tissues are made of organs
(C) Organs are made of organ systems
(D) Cells are made of tissues

Correct Answer: A

Explanation: Organ systems are groups of organs that perform related functions. Answer.