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Biology Grade 9 — Chapter 8

Plant Physiology

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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.