Zip Preview fo Mapping Id (818452) ENGLISH ×

Q.1 **Which mineral deficiency in plants leads to inhibition of chlorophyll synthesis and yellowing of young leaves?**

A. Iron
B. Potassium
C. Phosphorus
D. Calcium

Answer: A

Sol: The correct answer is (a). **Explanation** Iron is vital for chlorophyll formation. When deficient, plants show interveinal yellowing, especially in younger leaves where iron is required most.
Additional Information • Option {b} affects stomatal function. • Option {c} mainly causes stunted root growth. • Option {d} affects meristem tissue formation.

Q.2 **Which process enables roots to absorb minerals against the concentration gradient?**

A. Active transport
B. Osmosis
C. Diffusion
D. Filtration

Answer: A

Sol: The correct answer is (a). **Explanation** Active transport uses cellular energy {ATP} to push minerals from low concentration in soil to higher concentration inside roots, against the gradient.
Additional Information • Option {b} and {c} work along the gradient, not against it. • Option {d} is mechanical, not cellular.

Q.3 **The hormone responsible for regulating the sleep–wake cycle in humans is—**

A. Melatonin
B. Insulin
C. Cortisol
D. Glucagon

Answer: A

Sol: The correct answer is (a). **Explanation** Melatonin from the pineal gland helps maintain circadian rhythm by signaling the body when it is time to sleep or stay awake. Its release typically increases in the dark.
Additional Information • Option {b} regulates glucose uptake. • Option {c} manages stress and metabolism. • Option {d} raises blood sugar levels.

Q.4 **Which substance will show the highest electrical conductivity when molten?**

A. Wax
B. Sugar
C. Sodium chloride
D. Sulphur

Answer: C

Sol: The correct answer is (c). **Explanation** Molten NaCl contains freely moving ions that allow electric current to pass. In solid state, ions are fixed, but in molten form, conductivity increases sharply.
Additional Information • Option {a} and {b} are covalent and do not ionize. • Option {d} is also non-ionic and poor conductor.

Q.5 **Identifying misconceptions after an activity supports—**

A. Rote learning
B. Conceptual change
C. Drill practice
D. Textbook recall

Answer: B

Sol: The correct answer is (b).
Explanation Addressing misconceptions helps students replace incorrect ideas with scientifically accurate concepts through reflection and evidence.
Additional Information • Option {a} and {c} focus on repetition. • Option {d} does not confront misconceptions.

Q.6 **A force of 25 N moves an object 3 m. What is the work done?**

A. 50 J
B. 60 J
C. 70 J
D. 75 J

Answer: D

Sol: The correct answer is (d). **Explanation** Work = Force × Distance = 25 × 3 = 75 {joules}.
Additional Information • Option {a} assumes 2 m distance. • Option {b} assumes force = 20 N. • Option {c} miscalculates multiplication.

Q.7 **Which gas is responsible for decompression sickness ("the bends"} in divers?**

A. Oxygen
B. Nitrogen
C. Carbon dioxide
D. Helium

Answer: B

Sol: The correct answer is (b). **Explanation** Under high pressure, nitrogen dissolves in blood. Rapid ascent releases bubbles, causing joint pain and tissue damage known as the bends.
Additional Information • Option {a} does not dissolve significantly at pressure. • Option {c} is exhaled regularly. • Option {d} is used to prevent bends.

Q.8 **The part of the human brain responsible for maintaining balance and posture is—**

A. Cerebrum
B. Cerebellum
C. Medulla
D. Pons

Answer: B

Sol: The correct answer is (b). **Explanation** The cerebellum coordinates movement, posture, and balance, ensuring smooth muscular activity and body stability.
Additional Information • Option {a} controls thinking and voluntary actions. • Option {c} regulates involuntary functions like heartbeat. • Option {d} functions mainly as a relay center.

Q.9 **Allowing students to design their own evaporation experiment is an example of—**

A. Open inquiry
B. Expository method
C. Memorization technique
D. Teacher-centered learning

Answer: A

Sol: The correct answer is (a). **Explanation** Students make decisions about procedures and variables, showing full investigative freedom characteristic of open inquiry.
Additional Information • Option {b} is teacher-led. • Option {c} does not involve investigation. • Option {d} contradicts student autonomy.

Q.10 **A student observes a rainbow after rainfall. Which sequence of processes is responsible?**

A. Reflection → Refraction → Dispersion
B. Dispersion → Refraction → Reflection
C. Refraction → Dispersion → Internal reflection
D. Diffraction → Reflection → Refraction

Answer: C

Sol: The correct answer is (c). **Explanation** When sunlight enters raindrops, it bends (refraction), splits into colors (dispersion), and reflects inside the drop before emerging to form a rainbow.
Additional Information • Option {a} places reflection too early. • Option {b} incorrectly starts with dispersion. • Option {d} diffraction is not involved.

Q.11 **Models and simulations in science teaching are MOST useful for—**

A. Visualizing abstract concepts
B. Memorizing equations
C. Reducing participation
D. Avoiding experiments

Answer: A

Sol: The correct answer is (a). **Explanation** Models help simplify and represent invisible processes like atomic structure, making them easier for students to understand.
Additional Information • Option {b} does not require models. • Option {c} is not an educational goal. • Option {d} is incorrect because models do not replace experiments.

Q.12 **Among the following atmospheric gases, which exhibits the highest degree of aqueous solubility due to its reactivity with water molecules forming a weak acid?**

A. Nitrogen
B. Oxygen
C. Carbon dioxide
D. Hydrogen

Answer: C

Sol: The correct answer is (c). **Explanation** CO_2 dissolves readily in water because it reacts to form carbonic acid, increasing its effective solubility far more than gases that remain chemically unchanged.
Additional Information • Option {a} is mostly inert and poorly soluble. • Option {b} dissolves slightly but not as much as CO_2. • Option {d} barely dissolves due to its non-polar nature.

Q.13 **A 240 g metal piece has density 8 g/cm^3. What is its volume?**

A. 20 cm^3
B. 24 cm^3
C. 30 cm^3
D. 40 cm^3

Answer: C

Sol: The correct answer is (c). **Explanation** Volume = {Mass ÷ Density} = 240 ÷ 8 = 30 {cm^3}.
Additional Information • Option {a} corresponds to higher density. • Option {b} corresponds to lower mass. • Option {d} corresponds to density 6 g/cm^3.

Q.14 **Mixing 100 mL water at 30°C with 200 mL water at 60°C gives a final temperature of—**

A. 45°C
B. 50°C
C. 55°C
D. 60°C

Answer: B

Sol: The correct answer is (b). **Explanation** Final temperature = Weighted average = {100×30 + 200×60} ÷ 300 = 15000 ÷ 300 = 50°C.
Additional Information • Option {a} is too low. • Option {c} assumes more influence of cooler water. • Option {d} would occur only if volumes were equal.

Q.15 **When a glass rod is rubbed with silk, it becomes positively charged because—**

A. Protons move to silk
B. Electrons move from glass to silk
C. Neutrons move to silk
D. Silk gains protons

Answer: B

Sol: The correct answer is (b). **Explanation** Rubbing causes electrons to transfer, leaving glass electron-deficient and positively charged. Protons never move during charging.
Additional Information • Option {a} and {d} are impossible since protons are fixed in nuclei. • Option {c} neutrons are never transferred.

Q.16 **Which organelle helps plant cells maintain turgor pressure by storing water and dissolved substances?**

A. Chloroplast
B. Vacuole
C. Golgi body
D. Ribosome

Answer: B

Sol: The correct answer is (b).
Explanation The central vacuole stores water and solutes, helping the cell remain firm by exerting turgor pressure against the cell wall. This is essential for maintaining plant rigidity and structural support.
Additional Information • Option {a} carries out photosynthesis, not pressure maintenance. • Option {c} packages and modifies proteins. • Option {d} produces proteins, unrelated to turgor pressure.

Q.17 **A car accelerates from 8 m/s to 20 m/s in 4 seconds. What is the acceleration?**

A. 2 m/s^2
B. 3 m/s^2
C. 4 m/s^2
D. 5 m/s^2

Answer: B

Sol: The correct answer is (b). **Explanation** Acceleration = {Change in velocity ÷ Time} = {20 − 8} ÷ 4 = 12 ÷ 4 = 3 {m/s^2}.
Additional Information • Option {a} matches a smaller velocity change. • Option {c} assumes incorrect time division. • Option {d} corresponds to a much larger change.

Q.18 **Copper utensils turn green over time due to—**

A. Decomposition
B. Oxidation
C. Reduction
D. Sublimation

Answer: B

Sol: The correct answer is (b). **Explanation** Copper reacts with oxygen, CO_2, and moisture to form basic copper carbonate, giving the surface a greenish layer called patina.
Additional Information • Option {a} involves breakdown reactions. • Option {c} involves electron gain, not loss. • Option {d} is unrelated to metals.

Q.19 **In vertebrate zoology, which group has a heart where oxygenated and deoxygenated blood partially mix due to a single ventricle?**

A. Birds
B. Mammals
C. Amphibians
D. Crocodiles

Answer: C

Sol: The correct answer is (c). **Explanation** Amphibians have a three-chambered heart {two atria, one ventricle}, leading to partial mixing of blood, a key feature of their circulatory system.
Additional Information • Option {a} and {b} have fully separated four-chambered hearts. • Option {d} also has four chambers but is a reptile exception.

Q.20 **A wire with resistance 5 Ω carries 0.6 A current. What is the voltage across it?**

A. 2 V
B. 3 V
C. 4 V
D. 5 V

Answer: B

Sol: The correct answer is (b). **Explanation** Using Ohm's law: Voltage = Current × Resistance = 0.6 × 5 = 3 {volts}.
Additional Information • Option {a} uses 0.4 A. • Option {c} uses 0.8 A. • Option {d} uses 1 A instead of 0.6 A.
