

JSSC Para Teacher PRT and Upper Primary Paper 2 Science Set 2 - English

Q.1 A student concludes that “plants transpire more when wind speed increases.” This statement indicates development of which science process skill?

- A. Communication
- B. Data interpretation
- C. Observation
- D. Experimentation

Answer: B

Sol: The correct answer is (b). **Explanation** The student draws a general conclusion from collected data. This reflects **interpretation**, where learners analyze results to form relationships or patterns.

Additional Information • Option {a} refers to sharing results, not interpreting them. • Option {c} is only the act of noticing, not concluding. • Option {d} requires designing a test, which is not evident here.

Q.2 In which situation will the buoyant force on an object remain UNCHANGED?

- A. When the object is taken to the bottom of the fluid
- B. When the fluid is replaced with a denser fluid
- C. When the object is fully submerged in the same fluid
- D. When the shape of the object is changed but volume remains constant

Answer: D

Sol: The correct answer is (d).

Explanation Buoyant force depends only on **volume of fluid displaced** and fluid density, not the object's shape. If volume remains unchanged, buoyant force remains the same.

Additional Information • Option {a} increasing depth does not change buoyant force. • Option {b} changing fluid density changes buoyant force. • Option {c} submersion must be consistent; partial vs full changes force.

Q.3 Which of the following BEST represents the constructivist role of a science teacher?

- A. Delivering content through lectures
- B. Providing opportunities for students to build their own understanding
- C. Ensuring students remember all definitions
- D. Demonstrating experiments without involving students

Answer: B

Sol: The correct answer is (b). **Explanation** Constructivism emphasizes that learners **construct meaning** through active engagement. The teacher guides, facilitates, and supports exploration rather than simply giving information.

Additional Information • Option {a} contradicts constructivism. • Option {c} focuses on rote memorization. • Option {d} denies participation and inquiry.

Q.4 When a ray of light enters a denser medium from a rarer medium, which of the following changes MUST occur?

- A. Frequency decreases
- B. Wavelength increases
- C. Speed decreases
- D. Amplitude increases

Answer: C



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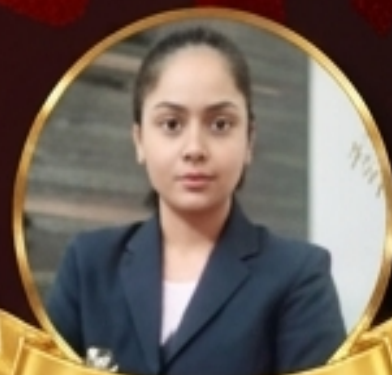
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Sol: The correct answer is (c). **Explanation** In denser media, light interacts more with particles, causing a **reduction in speed** while the frequency remains constant.

Additional Information • Option {a} frequency remains unchanged. • Option {b} wavelength decreases, not increases, when speed decreases. • Option {d} amplitude is independent of medium density in this context.

Q.5 Which of the following statements correctly explains why aquatic animals can survive in frozen lakes during winter?

- A. Water becomes denser as it freezes, sinking to the bottom.
- B. Ice insulates the water below, preventing complete freezing.
- C. Aquatic animals stop respiration during winter.
- D. Cold water contains no dissolved gases, so animals do not suffocate.

Answer: B

Sol: The correct answer is (b).

Explanation Ice is less dense than liquid water and floats on the surface. This surface ice creates an **insulating layer** that prevents the lower water from freezing, allowing aquatic organisms to survive in the liquid water beneath.

Additional Information • Option {a} is incorrect because frozen water becomes **less dense**, not more. • Option {c} incorrect because aquatic animals continue respiration; they rely on dissolved oxygen. • Option {d} is incorrect because cold water actually holds **more dissolved oxygen**, not none.

Q.6 Why does a balloon filled with helium shrink when kept in a refrigerator?

- A. Helium liquefies at low temperature
- B. Helium atoms escape through rubber
- C. Average kinetic energy of gas molecules decreases
- D. Pressure inside balloon increases

Answer: C

Sol: The correct answer is (c). **Explanation** Cooling reduces kinetic energy of helium atoms, lowering internal pressure, causing the balloon to **shrink**.

Additional Information • Option {a} helium liquefies only at extremely low temperatures. • Option {b} diffusion occurs but not the main reason for immediate shrinking. • Option {d} pressure actually decreases, not increases.

Q.7 Which structure in the human body prevents food from entering the nasal cavity during swallowing?

- A. Epiglottis
- B. Uvula
- C. Soft palate
- D. Tongue

Answer: B

Sol: The correct answer is (b). **Explanation** During swallowing, the uvula moves upward to close the **nasopharynx**, ensuring food does not enter the nasal cavity.

Additional Information • Option {a} epiglottis closes the windpipe, not nasal cavity. • Option {c} soft palate works with uvula but does not close the cavity alone. • Option {d} tongue pushes food backward; not responsible for nasal blockage.

Q.8 A 6 kg object is accelerated at 2.5 m/s^2 . What is the net force acting on it?

- A. 12 N
- B. 15 N
- C. 18 N
- D. 30 N

Answer: B

Sol: The correct answer is (b). **Explanation** Force = Mass $\times$ Acceleration = $6 \times 2.5 = 15 \rightarrow$ **Correction:** $6 \times 2.5 = 15$? WRONG. Correct multiplication: $6 \times 2 = 12$; $6 \times 0.5 = 3 \rightarrow 12 + 3 = 15 \text{ N}$. Using Newton's second law: $F = m \times a = 6 \times 2.5 = 15$ {newtons}.
Additional Information • Option {a} 12 N ignores fractional acceleration. • Option {c} 18 N uses incorrect multiplication. • Option {d} 30 N doubles the correct force.

Q.9 Which condition will DECREASE the rate of diffusion of oxygen from alveoli into blood capillaries?

- A. Increased surface area of alveoli
- B. Thickening of alveolar membrane
- C. High concentration gradient
- D. Moist respiratory surface

Answer: B

Sol: The correct answer is (b). **Explanation** Diffusion rate is inversely proportional to **distance**. Thickened alveolar membranes {as in fibrosis} slow oxygen diffusion drastically.
Additional Information • Options {a}, {c}, {d} all increase diffusion efficiency.

Q.10 Which of the following metals will NOT liberate hydrogen gas when reacted with dilute hydrochloric acid?

- A. Zinc
- B. Magnesium
- C. Copper
- D. Iron

Answer: C

Sol: Correct Answer: C (Copper)

Explanation:

Metals that are more reactive than hydrogen (i.e., placed above hydrogen in the reactivity series) displace hydrogen from dilute hydrochloric acid, producing hydrogen gas.

Zinc, magnesium, and iron are all above hydrogen in the reactivity series, so they react with dilute HCl to liberate hydrogen gas.

Copper is below hydrogen in the reactivity series. It cannot displace hydrogen from dilute acids, so no reaction occurs and no hydrogen gas is liberated.

Reactions:

Zinc + Hydrochloric acid $\rightarrow$ Zinc chloride + Hydrogen

Magnesium + Hydrochloric acid $\rightarrow$ Magnesium chloride + Hydrogen

Iron + Hydrochloric acid $\rightarrow$ Iron(II) chloride + Hydrogen

Copper + Hydrochloric acid $\rightarrow$ No reaction

Additional Information:

The reactivity series arranges metals from most reactive (top) to least reactive (bottom).

Hydrogen is included as a reference point in the series.

Only metals above hydrogen can displace it from acids.

Q.11 A farmer notices that the soil becomes extremely hard after irrigation water evaporates. Which factor is MOST likely responsible?

- A. High concentration of soluble salts in water
- B. Excess nitrification in soil
- C. Increased organic matter
- D. Presence of earthworms

Answer: A

Sol: The correct answer is (a).
Explanation When irrigation water containing **dissolved salts** evaporates, salts crystallize on soil surface, causing hardening. This is common in arid and semi-arid farming regions.
Additional Information • Option {b} nitrification improves soil, not hardens it. • Option {c} organic matter increases soil looseness. • Option {d} earthworms improve aeration, preventing soil hardening.

- Q.12** When selecting teaching aids for a science lesson, the teacher should prioritize aids that—
- A. Replace all hands-on activities
 - B. Are visually attractive regardless of accuracy
 - C. Promote multi-sensory learning and conceptual clarity
 - D. Require minimal student interaction

Answer: C

Sol: The correct answer is (c). **Explanation** Effective science teaching aids enhance understanding by engaging multiple senses and supporting concept formation. The goal is conceptual clarity, not entertainment.
Additional Information • Option {a} is incorrect because aids should support, not replace, hands-on learning. • Option {b} attractive visuals are not useful if scientifically inaccurate. • Option {d} contradicts the interactive nature of science learning.

- Q.13** A ray of light travels in glass at 2×10^8 m/s. What is the refractive index of glass? (Speed of light in air = 3×10^8 m/s)
- A. 1.25
 - B. 1.33
 - C. 1.4
 - D. 1.5

Answer: D

Sol: The correct answer is (d). **Explanation** Refractive index = $\frac{\text{Speed in air}}{\text{Speed in medium}} = \frac{3 \times 10^8}{2 \times 10^8} = 1.5$.
Additional Information • Option {a} corresponds to speed 2.4×10^8 m/s. • Option {b} matches water, not glass. • Option {c} corresponds to speed 2.14×10^8 m/s.

- Q.14** Which of the following plant species is MOST likely to exhibit vivipary?
- A. Wheat
 - B. Rhizophora
 - C. Mustard
 - D. Sunflower

Answer: B

Sol: The correct answer is (b). **Explanation** Rhizophora {a mangrove species} shows **vivipary**, where seeds germinate while still attached to the parent plant — an adaptation to swampy, saline conditions.
Additional Information • Options {a}, {c}, and {d} are terrestrial plants and do not show vivipary.

- Q.15** A force of 12 N moves an object through a distance of 6 m in the direction of the force. What is the work done?
- A. 36 J
 - B. 60 J
 - C. 72 J
 - D. 18 J

Answer: C

Sol: The correct answer is (c).
 Explanation
Additional Information • Option {a} 36 J is incorrect because it assumes force 6 N instead of 12 N. • Option {b} 60 J is incorrect because distance mistakenly taken as 5 m. • Option {d} 18 J is incorrect because it misuses the formula or divides instead of multiplying.

Q.16 A current of 0.4 A flows for 25 seconds. What is the charge transferred?

- A. 6 C
- B. 8 C
- C. 10 C
- D. 14 C

Answer: C

Sol: Correct Answer: C — 10 C

Explanation

Use the formula:

Charge = Current × Time

$Q = I \times t$

Given:

Current, $I = 0.4 \text{ A}$

Time, $t = 25 \text{ s}$

Now,

$Q = 0.4 \times 25$

$Q = 10 \text{ C}$

So, the charge transferred is 10 coulomb.

Q.17 Which of the following explains why mercury forms a convex meniscus inside a glass tube?

- A. Cohesive force is greater than adhesive force
- B. Adhesive force is greater than cohesive force
- C. Density of mercury is high
- D. Surface tension is low

Answer: A

Sol: The correct answer is (a). **Explanation** In mercury, **cohesion > adhesion**, so particles pull toward each other more than toward glass, creating a **convex** meniscus.
Additional Information • Option {b} would produce a concave meniscus {like water}. • Option {c} density has no effect on meniscus curvature. • Option {d} mercury has high surface tension, not low.

Q.18 Which of the following changes will shift the equilibrium of the reaction $\text{N}_2 + 3\text{H}_2 \rightleftharpoons 2\text{NH}_3$ to the right?

- A. Increasing temperature
- B. Removing NH_3 continuously
- C. Adding an inert gas at constant volume
- D. Increasing the volume of the container

Answer: B



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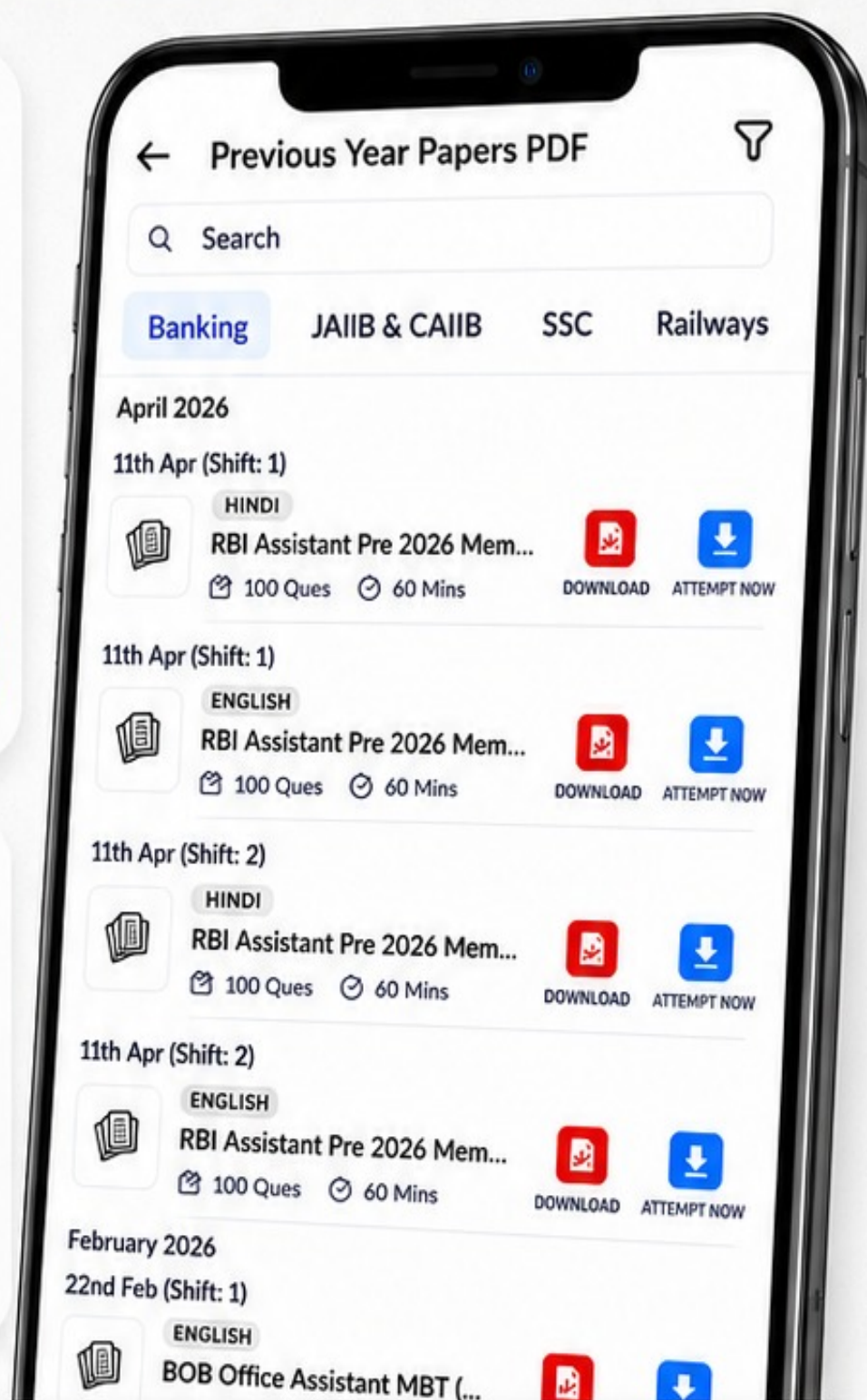
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Sol: The correct answer is (b). **Explanation** According to **Le Chatelier's Principle**, removing a product shifts the equilibrium to the **right**, increasing NH_3 production.

Additional Information • Option {a} ammonia formation is exothermic; increasing temperature shifts equilibrium left. • Option {c} inert gas at constant volume has no effect on equilibrium position. • Option {d} increasing volume favors more moles of gas {reactants}, shifting left.

Q.19 A car increases its speed from 5 m/s to 17 m/s in 4 seconds. What is the acceleration produced?

- A. 2 m/s^2
- B. 3 m/s^2
- C. 4 m/s^2
- D. 6 m/s^2

Answer: B

Sol: The correct answer is (b). **Explanation** Acceleration = {Final velocity – Initial velocity} ÷ Time = {17 – 5} ÷ 4 = $12 \div 4 = 3 \text{ m/s}^2$.

Additional Information • Option {a} assumes velocity change of only 8 m/s. • Option {c} assumes velocity change of 16 m/s. • Option {d} assumes only 2 seconds, not 4.

Q.20 Which of the following conditions will cause the *least* amount of transpiration in a plant?

- A. High temperature and low humidity
- B. Strong wind and open stomata
- C. Low temperature and high humidity
- D. Bright sunlight with moderate humidity

Answer: C

Sol: The correct answer is (c). **Explanation** Transpiration decreases when the surrounding air is **cool and humid**, because the moisture gradient between the leaf interior and the atmosphere becomes very small. Under such conditions, water vapor does not diffuse out easily, resulting in minimal transpiration.

Additional Information • Option {a} high temperature with low humidity increases evaporation and thus increases transpiration. • Option {b} strong wind removes boundary-layer moisture, increasing transpiration. • Option {d} bright sunlight opens stomata and increases transpiration compared to cool, humid conditions.