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Question: 1

Select the answer choice that corrects an error in the underlined portion. If there is no error, choose D indicating that no change is necessary.
Given that (A) your thirteen years old, I think you are (B) too old to pay a (C) lower price at the movies.

A. you're
B. to
C. lesser
D. No change is necessary.

Answer: A

Explanation:
The error in the sentence is found in the underlined portion (A) "your thirteen years old." The correct form should be "you're," which is a contraction for "you are." This contraction correctly reflects the intended meaning of the sentence, indicating the present state of being thirteen years old. Here's why the correction is necessary: - "Your" is a possessive adjective used to describe something that belongs to you, e.g., your book, your idea. - "You're" is a contraction of "you are," which is a verb phrase used to describe or state something about the subject (in this case, "you"). None of the other parts of the sentence have errors: - Part (B) "too old" is correct as it indicates being excessively old for something, which in this context is paying a lower price at the movies. - Part (C) "lower price" is correctly used to indicate a reduced price, which is appropriate in the context of ticket pricing based on age. Therefore, the correction needed is in part (A), replacing "your" with "you're." The appropriate answer choice would be the one indicating this change. The explanation for the correction involves understanding the difference between a possessive adjective ("your") and the contraction of the verb to be with the pronoun "you" ("you're"), which reflects the need for expressing the state of being in the sentence.

Question: 2

The symbol ~ is defined by a ~ b = (a / b)1/2
What is the value of (48 ~ 3) ~ 2 ?

A. √2
B. 2
C. √3
D. 2√6

Answer: A

Explanation:
48 ~ 3 = (48 / 3)1/2 = 161/2 = 4

∴(48 ~ 3) ~ 2 = 4 ~ 2 = (4 / 2)1/2 = 21/2 = √2

Question: 3

The tires on the wheels of Tom's truck have a diameter of 21 inches.
If Tom's truck travels 6 miles, how many revolutions do the wheels make?
Use 22/7 as an approximation for π.

A. 5760
B. 5765
C. 2444
D. 5680

Answer: A

Explanation:
Step 1. Find the circumference of the tire:
C = πd = 22/7 * 21 inches = 66 inches
This is the distance the truck moves forward as the wheels rotate once.
Step 2. Find the total distance in inches, recalling that there are 1760 yards in a mile, 3 feet in a yard, and 12 inches in a foot. (=5280 feet in a mile and 12 inches in a foot. Use whichever figures are easier to remember.)
6 miles = 6 * 1760 * 3 * 12 inches = 380160 inches (or 6 * 5280 * 12 = 380160 inches)
Step3 . Divide the total distance by the distance moved in one revolution:
∴Number of revolutions = (6 * 1760 * 3 * 12)/66 = (1760 * 36)/11 = 160 * 36 = 5760

Question: 4

 (1)Most professionals will tell you that five steps do not even come close to explaining the entire troubleshooting process, and they are (mostly) right. (2) But I am not teaching you how to troubleshoot computers on a professional level, rather I am showing you how the troubleshooting process works so as you learn, you can develop your own troubleshooting method. (3)
First, identify the Problem.
(4)Now you might think that this is an obvious step but sometimes it is overlooked or not done properly. (5) First off, you break the problem into one of two categories, either Hardware or Software. (6) This is done by eliminating all possible causes of one section then the other or simply figuring out what an error message says. (7) So an error message with a path to a program file is probably a software problem, while numerous beeps emitting from your computer during the POST is probably a hardware problem. (8)
Note: if the error message gives you some sort of code, copy that down then google it, or put it in a post on a forum asking for help.
After reading the "Identify the Problem" section, one might feel what?

A. He/she should call a repairperson.
B. This problem is going to be expensive to repair.
C. This is a serious problem.

D. Troubleshooting is a good idea.
E. Buying a new computer would be a good idea.

Answer: D

Explanation:
Troubleshooting is a good idea is correct because the author gives the reader ways to determine how serious the problem is. The expense is incorrect because the reader has nothing to base this on at this stage of investigation. Being a serious issue is not a good answer choice because the investigation phase is too early to make this determination. Buying a new computer is probably a premature reaction in the troubleshooting phase.

Question: 5

(1) The contrast between then and now is astonishing. (2) They were on the verge of starvation; we are fighting an epidemic of obesity. (3) They might have to subsist for months on potatoes or stale bread; we have a glut of food options at our instant disposal. (4) They had shortened life spans and were highly vulnerable to injury and disease. (5) We live longer but suffer cruel lingering degenerative conditions. (6) It is clear from a realistic view of times gone by that it was not the advent of modern medicine that brought relief, it was, as I mentioned in a previous article on SARS, the plumber bringing public utilities and with that the possibility of hygiene and the trucker distributing food supplies that brought us our present long lives.

All of the following contrasts between then and now are either implied or stated in the passage EXCEPT:

A. too few choices vs. too many choices
B. starvation vs. gluttony
C. clean air vs. polluted air
D. shorter life spans vs. longer life spans
E. filthy and harsh living conditions vs. clean and comfortable accommodations

Answer: C

Explanation:
"Too few choices vs. too many choices" is found in sentence 3. "Starvation vs. gluttony" is found in sentence 2. "Shorter life spans vs. longer life spans" is found in sentence 5. "Filthy and harsh living conditions vs. clean and comfortable accommodations" is found in sentence 6. There is no reference to the air.

Question: 6

In biological experiments, which of the following is the best and safest way to heat samples?

A. A methane burner.
B. A hot plate.
C. A space heater.
D. A heating blanket.

Explanation:

In biological experiments, precise temperature control and safety are paramount. Among the options provided—methane burner, hot plate, space heater, and heating blanket—the best and safest method to heat samples is utilizing a hot plate. This choice is due to several key factors that prioritize both the integrity of the samples and the safety of the laboratory environment.

Firstly, a hot plate provides a stable and controllable source of heat, with the ability to set specific temperatures necessary for various biological reactions and processes. This level of control is crucial in experiments where even slight temperature variations can lead to significant differences in outcomes. Unlike open flames from a methane burner, which can fluctuate and are harder to control precisely, hot plates maintain a consistent temperature, ensuring experimental reliability.

Moreover, safety in the laboratory is another critical consideration. A hot plate, unlike a methane burner, does not involve open flames. Open flames can present a significant hazard, especially in environments where flammable materials, such as solvents or volatile chemicals, are used. These substances can easily ignite, posing a risk of fire or explosion. Additionally, open flames can also lead to accidental burns to personnel.

Comparatively, space heaters and heating blankets are generally not suitable for laboratory experiments involving heating samples. Space heaters are designed to warm environments and are not typically used for direct heating of experimental samples due to their imprecise temperature control and safety risks. Heating blankets, while useful for maintaining temperature in certain contexts, do not offer the necessary precise temperature adjustment needed for most biological experiments.

In conclusion, a hot plate stands out as the safest and most effective method for heating samples in biological experiments. It combines the essential elements of safety, precision, and reliability, thereby facilitating accurate experimental results while minimizing risk in the laboratory setting.

Question: 7

Two salt solutions are separated by a semi-permeable membrane. Water can pass freely between the A and B sides, but salt cannot. The figures show the water levels on each side before and after the body is allowed to get to equilibrium. What can be said about the figure and the water in the curved tube above?

BEFORE   AFTER

Membranes
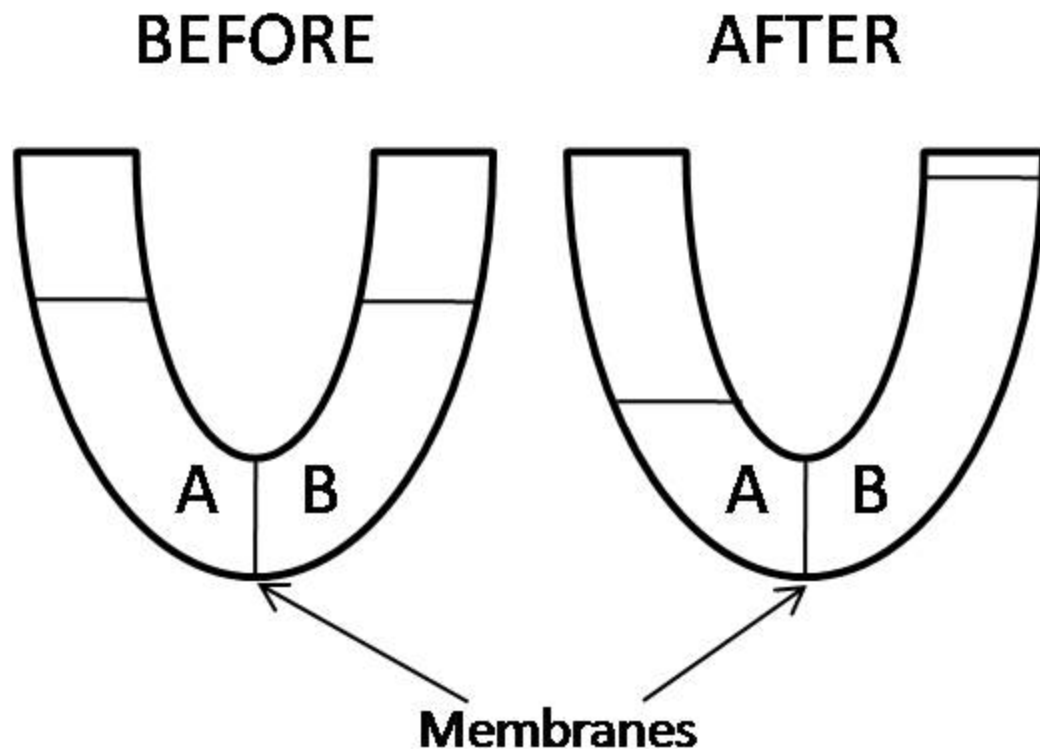
A. In the BEFORE figure, the concentration of salt is higher in A than in B.
B. In the BEFORE figure, the concentration of salt is higher in B than in A.
C. In the AFTER figure, the concentration of salt is higher in B than in A.
D. The arrangement is not physically possible.

Answer: B

Explanation:
The scenario described is a classic example of osmosis, which is the movement of water across a semi-permeable membrane from a region of lower solute concentration to a region of higher solute concentration. In this context, the solute is salt, which cannot pass through the membrane, whereas the solvent (water) can move freely.

Initially, if the concentration of salt is higher on side B than on side A, it implies that side B is more hypertonic relative to side A, which is more hypotonic. In response to this concentration gradient, water molecules will naturally move through the semi-permeable membrane from side A (lower salt concentration) to side B (higher salt concentration). This osmotic movement of water continues until the osmotic pressure equilibrates the solute concentrations on both sides of the membrane, or until another physical limit is reached, such as the volume capacity of the container.

As water moves from side A to side B, the water level on side B will rise while it decreases on side A. This change in water levels is a direct result of the osmotic flow of water. The water in the curved tube typically acts as a manometer, indicating the pressure or level changes due to the movement of water. An increase in water level on side B visually confirms the net movement of water to that side, supporting the conclusion that side B had a higher salt concentration initially.

This understanding of the osmotic process not only confirms the correct answer but also highlights the fundamental principles of semi-permeable membranes and osmosis in maintaining concentration balances in various biological and chemical systems.

Question: 8

Which of the following were the primary commanders of the armies fighting at the Battle of Yorktown in 1781?

A. Benedict Arnold and Simon Fraser.
B. Robert Howe and Archibald Campbell.
C. George Washington and Charles Cornwallis.
D. Nathanael Greene and Alexander Stewart.

Answer: C

Explanation:
The correct answer to the question about the primary commanders at the Battle of Yorktown in 1781 is "George Washington and Charles Cornwallis."
General George Washington was the commander-in-chief of the Continental Army, which was the army fighting for the American colonies' independence from British rule. Under his leadership, the American forces, along with their French allies, laid siege to the British forces at Yorktown, Virginia. This strategic move was crucial in cornering the British army on a peninsula, making escape difficult.
General Charles Cornwallis, a leading British commander during the American Revolutionary War, led the British troops stationed at Yorktown. Cornwallis had a distinguished military career and was tasked with commanding the British forces in the southern colonies. His surrender at Yorktown marked a significant turning point in the war.
The Battle of Yorktown, which took place in October 1781, was indeed the last major battle of the American Revolution. It involved a combined force of American Continental Army troops and French troops under the command of General Washington, and the French General, the Comte de Rochambeau. The Franco-American forces successfully besieged Yorktown, trapping Cornwallis and his troops. After several weeks of siege and bombardment, Cornwallis was compelled to surrender, effectively ending major hostilities and paving the way for American independence.
The choices listed in the question include other historical figures, such as Benedict Arnold, Simon Fraser, Robert Howe, Archibald Campbell, Nathanael Greene, and Alexander Stewart. While some of these individuals played roles in various capacities during the Revolutionary War, they were not the primary commanders at the Battle of Yorktown. Thus, the correct and most direct answer remains George Washington and Charles Cornwallis, highlighting their pivotal roles in this decisive victory for the American forces.

Question: 9

The Great Lakes region is most accurately characterized as:

A. A humid continental, warm summer climate zone.
B. A highland climate zone.

C. A humid continental, cool summer climate zone.
D. A semi-arid steppe climate zone.

Answer: C

Explanation:
The Great Lakes region is most accurately characterized as having a humid continental, cool summer climate zone. This classification is based on the Köppen climate classification system, which categorizes climates based on temperature and precipitation patterns.

The term "humid continental" refers to a climate typically found in the mid-latitudes where there is significant variation in temperature between seasons, with warm to hot summers and cold winters. This type of climate also features adequate precipitation spread throughout the year, often peaking during the warmer months when the capacity for moisture in the air is higher due to elevated temperatures.

In the specific context of the Great Lakes region, which includes parts of the northeastern United States and southeastern Canada, the "cool summer" subtype of the humid continental climate is prevalent. This subtype is often designated as "Dfb" in the Köppen system. It is characterized by milder summers where the average temperature in the warmest month is below 22°C (72°F), but above 10°C (50°F). This contrasts with the "warm summer" subtype (Dfa), where the average temperature in the warmest month exceeds 22°C.

The cooler summer temperatures in the Great Lakes region can be attributed to several geographical and environmental factors. The presence of the large bodies of water of the Great Lakes themselves moderates the temperature, providing a cooling effect during the summer months. Additionally, the region's higher latitude (generally above 40° North) also contributes to the cooler summer temperatures compared to areas further south.

Winters in the Great Lakes region are typically cold with temperatures often dropping below freezing. This is consistent with the characteristics of a continental climate, which experiences more extreme temperature differences between summer and winter compared to maritime climates.

Understanding the climate of the Great Lakes region is essential for various aspects such as agriculture, urban planning, and managing natural resources. The cool summer climate impacts the growing seasons and types of crops that can be cultivated, while also influencing the design and energy needs of buildings in the area. By recognizing the Great Lakes region as having a humid continental, cool summer climate, we can better appreciate and manage the environmental and socioeconomic activities that are influenced by this specific climatic condition.

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