

New Trier Scobol Solo 2014

Round 11



1. The Drude [DROO-duh] and free electron models model the behavior of electrons as if they were one of these substances. The internal energy of one of these substances is only dependent on temperature, according to Joule's ["jewel's"] second law. These substances have a compressibility factor of one, and monatomic [mahn-uh-TAH-mik] ones have a heat capacity of $3/2$ ["three halves"] at constant volume. Substances tend to act more like these with higher temperature and lower pressure, when intermolecular forces are weaker. The namesake constant of these substances is roughly 8.314 joules per mole-kelvin. Identify these substances whose namesake equation states that $PV = nRT$, and which are used to model a certain phase of matter.

Answer: ideal gases [prompt on gases]

2. After this battle, the "Lion's Mound" was constructed on the site where a future William II was wounded in it. The day before this battle, there was a short cavalry skirmish at Genappe [zheh-nap] and heavy rains, which delayed the start of this battle until around noon on June 18. This battle's losing leader attempted to flee to the United States but instead surrendered aboard the HMS *Bellerophon*. This battle was fought shortly after the Battle of Quatre Bras [kwat-ruh brah] and was the last battle for Michel Ney [mee-shel neh]. Identify this 1815 battle fought in what is now Belgium that saw the Seventh Coalition under von Blücher [BLOO-kur] and the Duke of Wellington end the Napoleonic era.

Answer: Battle of Waterloo

3. Two men in the foreground of a painting by this artist use a door to carry several plates of food. A skeleton is about to execute a man kneeling in prayer on the right side of one painting by this artist, in which several men wield shields with crosses engraved on them as they try to fight an army of skeletons. This painter of *The Triumph of Death* and *The Peasant Wedding* depicted a mythical character's legs flailing in the water while a shepherd walks by failing to notice in another painting. Name this Flemish painter of *The Tower of Babel* and *Landscape with the Fall of Icarus*.

Answer: Pieter Bruegel [BROO-gul] the Elder [or Peasant Bruegel]

4. Due to a combination of horizontal and vertical fissures, two of these objects in Utah are named Crazy Quilt and Checkerboard. Escarpments and these objects are covered by the same type of layer, called a caprock. Sedona can be seen from the Brins and Airport examples of these objects. The largest of these objects is located near Grand Junction, Colorado and is named Grand. When these objects become very eroded, the remainder may be a butte [byoot]. These geological structures are similar to, but much smaller than, plateaus. Name these flat-topped structures whose name is Spanish for “table”.

Answer: mesas [prompt on flat-topped mountains or tablelands]

5. In 2014, University of Queensland researchers used two of these particles to simulate time travel. Blackbody radiation can be explained using a gas made up of these particles. Arthur Compton verified that these particles have momentum, and these particles lose energy during Compton scattering. Albert Einstein hypothesized the existence of these particles to explain electron emission. These particles are represented by the letter gamma because they make up gamma rays, and they are also the components of microwaves and X-rays. Name these carriers of the electromagnetic force, the quanta of light.

Answer: photons

6. In a Chinese legend, Tchang uses a magical one of these objects to cure his mother’s blindness after receiving this as a gift from a dragon. Pandaïa was given one of these objects on her wedding day by her father Krishna. Legend has it that Cleopatra dissolved one and drank the liquid to impress Marc Antony. In the Book of Matthew, Jesus talked about a merchant who sold everything to buy one of these objects. Based on that parable, the Latter Day Saints Church collected some of Joseph Smith’s works into a book named for this object “of great price”. In Revelation, the gates to heaven were made from these objects. Name these gemstones found inside oysters.

Answer: pearl [prompt on earring]

7. One opera by this composer has an aria, inspired by John Donne [dun], that begins “Batter my heart, three-personed God”. In another opera by this composer, a dead man sings the “Aria of the Falling Body” as his corpse approaches water. That opera by this composer begins with “Chorus of Exiled Jews” and “Chorus of Exiled Palestinians”, and it addresses the hijacking of the cruise ship *Achille Lauro*. Another opera by this composer centers on J. Robert Oppenheimer. After 9/11, this composer wrote *On the Transmigration of Souls*. Name this composer of *The Death of Klinghoffer*, *Doctor Atomic*, and *Nixon in China*.

Answer: John (Coolidge) Adams

8. JSON [“Jason”] is a “notation”, inspired by JavaScript, for writing these things. They usually feature encapsulation, meaning that access to their fields is controlled. These things can inherit from supertypes and are created by constructors. In Java, this type includes methods named `hashCode()` and `equals()`, and everything except primitives inherits from it. C++ [“see plus plus”] uses a paradigm named for this term, which is abbreviated “OOP”. Give this term for an instance of a class, around which a certain type of programming is “oriented”.

Answer: objects

9. This character’s fingernails are described as “more polished than the ivory of Dieppe”, and her eyes are brown but seem black because of the lashes. This character writes a letter that she plans to deliver in a cathedral but later tears up during a long carriage ride that makes her miss her ride to Yonville. This person marries the former husband of Heloise Dubuc after he takes care of her father’s leg. This person buys expensive items from Monsieur Lheureux [lur-ur] and then seeks loans from Léon and Rodolphe, two of the men she has affairs with. Name this title character of a novel by Gustave Flaubert.

Answer: (Madame) Emma Bovary [accept either underlined name]

10. During DNA replication, the addition of each nucleotide sees the release of two equivalents of this ion in a “pyro” form. The addition these groups to proteins usually occurs on serine [SAIR-een], threonine [“THREE”-uh-neen], and tyrosine [TEER-oh-seen] residues. One group of enzymes responsible for the addition of this group must bind to a cyclin [SYKE-lin] to function, and are an example of kinases [KY-nayss-iz]. This group is found on lipids in the cell membrane, and one common molecule consists of three of these groups bound to an adenosine [uh-DEN-oh-seen]. Name this ion with a minus-three charge, which is cleaved from ATP as a common source of energy.

Answer: phosphate [accept PO_4^{3-} or PO_4^{-3}]

11. One poem by this author is about a man who “annoyed confetti and assorted brands of businessman’s eyes.” That poem ends by stating that the man was holding “clean globes in his hands” and is about civil rights leader Medgar Evers. This woman wrote a poem about a flower, whose speaker declares that “I must watch myself / I must go to sleep.” Another poem by this author notes that “dinner is a casual affair” for an “old yellow pair.” This poet of “To Coora Flower” and “The Bean Eaters” penned a poem in which pool players “lurk late”, “strike straight”, “jazz june”, and “die soon”. Name this African-American woman who wrote “We Real Cool”.

Answer: Gwendolyn (Elizabeth) Brooks

12. During this year, the Catonsville Nine were arrested for burning government files. In reaction to earlier riots, the Kerner Commission warned during this year that “Our nation is moving toward two societies, one black, one white — separate and unequal.” During this year’s presidential election, a senator from Minnesota, Eugene McCarthy, lost the Democratic nomination to a vice president from Minnesota. That race for the nomination was shaken up when Sirhan Sirhan assassinated Robert Kennedy. At the Lorraine Motel in Memphis during this year, James Earl Ray assassinated Martin Luther King, Jr. Name this year during which Lyndon Johnson ended his re-election bid and Richard Nixon won his first presidential election.

Answer: 1968

13. The largo section of one of this composer’s symphonies ends with a chord for just double basses. At the 1893 Carnegie Hall premier of that symphony, this composer took a bow after each section due to the wild applause. This composer also wrote incidental music for *Josef Kajetán Tyl* [YOH-sef ky-yay-TAHN TEEL] including *My Home*, and he wrote several volumes of *Moravian Duets*. This composer included three sousedskás, two furiant, and two dumkas in his collection of sixteen pieces using folk rhythms, his *Slavonic Dances*. Name this composer whose symphonies include “The Bells of Zlonice [ZLOH-nee-say]” and “From the New World”.

Answer: Antonín (Leopold) Dvoák [d’VOR-zhahk]

14. This leader is believed to support Document Number Nine, which warns against universal values and is titled *Concerning the Situation in the Ideological Sphere*. This person has labeled corrupt politicians as “tigers” and corrupt bureaucrats as “flies”, and he declared he would make his army more efficient after troop movements undermined his state visit to India in September 2014. There was only one vote against this person at the 12th National People’s Congress, and he became his country’s president soon after becoming General Secretary of its Communist Party. Name this leader who replaced Hu Jintao and who one reporter mistakenly referred to as “Eleven”.

Answer: Xi Jinping [prompt on Jinping]

15. One character in this play is told that he should chop wood instead of letting his mother do it when he says he plans to inherit his Uncle Luke’s farm. At the beginning of its third act, Sam Craig returns home from Buffalo when his cousin dies in childbirth. In this play, a description of how much happens in three years is followed by Si Crowell following his brother’s paper route, telling Constable Warren and Howie Newsome about a retirement from baseball. This play is narrated by the Stage Manager, and it follows George Gibbs and Emily Webb, who grow up in Grover’s Corners. Name this work by Thornton Wilder.

Answer: Our Town

16. The United States and this country organized a claims tribunal as part of the Algiers Accords. This country was the site of the Cinema Rex fire, which was falsely blamed on its intelligence service, SAVAK. This country was at the center of the Abadan Crisis after its oil industry was nationalized by Prime Minister Mohammad Mosaddegh [moh-saa-day]. Mosaddegh was undermined by this country's monarch Mohammad Reza Pahlavi, and Pahlavi was later overthrown by an Islamist Revolution that held 52 American hostages. This country was then led by Ali Khamenei and Ayatollah Khomeini. Name this country, once known as Persia, that in 1943 hosted the "Big Three" Allied leaders at the Tehran Conference.

Answer: (Islamic Republic of) Iran [or (Jomhuri-ye Eslmi-ye) Irān]

17. Gary Becker wrote a paper about egoism, genetic fitness, and this behavior. The green-beard effect, which explains one type of this behavior, is based on a scenario in which this phenomenon is directed towards people who share a trait. The creation of a sticky substance through the suicidal type of this behavior has been observed in ants. Those types of this behavior are involved in the theory of kin selection, which explains why this behavior is beneficial when directed at an organism's relatives. Name this behavior that involves caring for the well-being of others, demonstrating selflessness.

Answer: altruism [accept word forms; prompt on kin selection before it is mentioned; prompt on selflessness]

18. In one novel by this author, the woman Dinah Morris is a lay Methodist preacher. In that novel by this author, the baby of Arthur Donnithorne is abandoned in a field by its mother. This author also wrote about Molly Farren, a drug addict who was found dead in the snow, leaving behind her daughter Eppie, who eventually loves Aaron Winthrop. In another novel by this author, the treatment of Fred Vincy leads to a rivalry between the doctors Wrench and Lydgate. That novel focuses on Casaubon's wife and then widow, Dorothea Brooke. Name this author of *Adam Bede*, *Silas Marner*, and *Middlemarch*.

Answer: George Eliot [or Mary Anne Evans]

19. If a plot of these values has an uneven envelope, it is a sign that data is heteroscedastic [HET-uh-roh-skeh-DAAS-tik], which means that different parts of the data have different variances. If these numbers follow a "U"-shaped pattern on a graph, it is an indication that a poor model has been chosen for the data. Regression methods minimize the sum of the squares of these values. These values apply to bivariate data in a way that is similar to the way deviations are used with single-variable data. Identify these values, sometimes confused with errors, that are equal to the difference between an observed value and the predicted value from a best-fit curve.

Answer: residuals [prompt on deviations; do not accept "standard deviation(s)"]

20. Pope Agapetus I referred to this man when he stated “With eager longing have I come to gaze upon the Most Christian Emperor.” This leader dealt with an insurrection led by groups who called for Hypatius to become the new emperor, as well as the resignation of John the Cappadocian. This subject of histories written by Procopius signed the Eternal Peace with Khosrow I. This man had Narses and Belisarius quell the Blue and Green factions at the Hippodrome during the Nika Riots, and his wife was the actress Theodora. Name this overseer of the construction of the Hagia Sophia, a sixth-century Byzantine emperor.

Answer: Justinian I [or Justinian the Great or Flavius Justinianus or Petrus Sabbatius; prompt on Justinian]

^{TB}21. This musical piece gained popularity during the 1970s when a seven-minute version of it — which is significantly longer than usual — was recorded by composer Jean-François Paillard [zhahn fran-swah py-lar] and placed on an album called *Go For Baroque*. Its basso continuo repeats eight quarter notes while three violins pass around the melody. Written by the composer of *Hexachordum Apollinis*, this piece begins with violin quarter notes that fall, then rise, then fall again. Legend has it that this piece was composed for a wedding of one of the Bachs, and it is now commonly played at weddings. Name this work written in approximately 1680 by Johann Pachelbel.

Answer: Pachelbel’s *Canon* in D [or *Canon and Gigue in D major for three Violins and Basso*]

^{TB}22. The existence of groundwater near one of these objects can lead to an opening called a maar and surface fractures called diatremes. Fumaroles, which can turn into hot springs, are found on or near these objects. Glass created by these objects is called Pele’s [PAY-lay’z] tears in honor of a goddess. These objects sometimes cause the climate to cool, and one was blamed in 1816 for the “year without a summer”. These objects can emit tephra [TEF-ruh] or pyroclasts into the air, some of which is igneous rocks. Classifications of these objects include cinder cones and the shield type. Name these objects located above magma, which emit ash and lava into the air when they erupt.

Answer: volcanoes

^{TB}23. Identify the body part that was eaten by Hannibal Lecter with fava beans and a nice chianti, may suffer from cirrhosis as a result of alcoholism, and is the largest internal organ responsible for producing bile and detoxifying the blood.

Answer: liver