



1. The kinetic isotope effect explains how molecules with a greater value for this quantity have slower reaction rates. The ratio of this quantity to charge can be determined by a form of spectrometry that forms molecular ions. This quantity, which is often measured in daltons or amus [A-M-Us], is reported on the Periodic Table by averaging it across all isotopes, explaining why cobalt has a higher value for it than nickel. For 15 points, name this quantity measured in grams per mole.

ANSWER: molar **mass** [or molecular **weight**; or formula **weight**]

190-13-104-19101

BONUS: This is a 20-second calculation question. A school brings six players to a quizbowl tournament. How many different ways are there to pick four players to play in a given round?

ANSWER: **15**

190-13-104-1910-11

2. In his first appearance, this character tells his housemate that he owns a bull pup and he gets up at “ungodly hours.” Once engaged to the governess Mary Morstan, he was a veteran of the British army and is greeted with the question “You have been in Afghanistan, I presume?” This medical doctor shares the flat at 221B Baker Street with his friend, and he narrates books like *A Study in Scarlet*. For 15 points, name this sidekick of Sherlock Holmes.

ANSWER: Doctor John **Watson** [or **John**]

052-13-104-19102

BONUS: J. S. Bach wrote a famous B minor example of what genre of religious composition featuring such sections as the “Kyrie” and “Agnus Dei”?

ANSWER: **mass**

014-13-104-1910-11

3. This man wrote that “harmonious madness” would flow from his lips in a poem where he requests to learn “half the gladness” of the title animal. This author wrote about “two vast and trunkless legs of stone” that “stand in the desert.” In that one of his poems, a traveler sees a colossal wreck with the inscription “Look on my works, ye Mighty, and despair!” This man praised the title bird in a poem that begins “Hail to thee, blithe spirit!” For 15 points, name this British poet of “To a Skylark” and “Ozymandias.”

ANSWER: Percy **Shelley**

052-13-104-19103

BONUS: Lara eventually dies in a gulag, never reuniting with Yuri, in what epic novel by Boris Pasternak?

ANSWER: ***Doctor Zhivago***

190-13-104-1910-11

4. The alpha chains of this protein are encoded from chromosome 16, while its beta chains are encoded from chromosome 11. This protein is a common sink of carbon dioxide in the body. A mutation in the beta chain of this protein results in sickle-cell anemia. An important component of this protein is a porphyrin ring with a central iron atom. Carbon monoxide poisoning is a result of this protein's affinity for that compound. For 15 points, identify this protein found in red blood cells that carries oxygen .

ANSWER: **hemoglobin**

066-13-104-19104

BONUS: What American filmmaker directed such landmarks as *2001: A Space Odyssey* and *The Shining*?
ANSWER: Stanley **Kubrick**

014-13-104-1910-11

5. The occurrence of these events is theorized to be due to photodisintegration, which causes a lack of degeneracy pressure from electrons. Heavy elements are primarily produced from these events. These events are classified as Type I or Type II, depending on whether hydrogen is present. Planetary nebulas result instead of this phenomenon for smaller stars. These events often happen after core collapse causes a large release of energy. They can leave behind neutron stars or black holes. For 15 points, name these massive stellar explosions.

ANSWER: **supernovas**

140-13-104-19105

BONUS: Identify the island whose namesake Vespers involved the massacre of Frenchmen in a revolt against the Angevin king Charles I.

ANSWER: **Sicily** [or **Sicilia**]

123-13-104-1910-11

6. The first holder of this office consolidated power in the Ridda Wars. One holder of this office established the *diwan* and conquered the Persian Empire. Another holder of this office led the written compilation of a holy text but was killed by rebels in Medina. That holder of this office, Uthman, was succeeded by a man considered by Shiites to be the first imam. For 15 points, name this office held by the successors of Muhammad, the first four of whom are known as the "Rightly Guided" of these.

ANSWER: **caliph** [or **khalifah**; or **Rashidun**; or **Rightly Guided Caliphs** before mention]

105-13-104-19106

BONUS: What painting by Jacques Louis David shows a French revolutionary in his bathtub?

ANSWER: *The **Death of Marat***

015-13-104-1910-11

7. The Falcon Reservoir is located on this river near Laredo. The largest dam on this river, Elephant Butte Dam, is located near the town of Truth or Consequences. This river's soil deposits formed Great Sand Dunes National Park in the San Luis Valley. Its major tributaries include the Conchos and Pecos Rivers. Twin cities like Matamoros-Brownsville and Ciudad Juarez-El Paso lie on this river. For 15 points, name this river on the border of Texas and Mexico.

ANSWER: Rio **Grande** [or Rio **Bravo** del Norte]

232-13-104-19107

BONUS: The Well of Zamzam is visited and a stone representing the devil is stoned during what pilgrimage to Mecca?

ANSWER: **Haji**

230-13-104-1910-11

8. In the buildup to this battle, orders were disobeyed by James Neill, who left his command before this battle. Two surviving witnesses of this battle were the infant Angelina and her mother Susanna Dickinson. A legend about this battle describes how a line was drawn in the sand by William Travis that the ill Jim Bowie had to be carried over. For 15 points, name this battle in which Santa Anna's forces killed Davy Crockett and all the Texan defenders of a fortified mission in San Antonio.

ANSWER: Battle of the **Alamo**

023-13-104-19108

BONUS: What three letters, in a shortening of a Latin phrase, are used to end a successful mathematical proof?

ANSWER: **Q.E.D.** [or **quod erat demonstrandum**]

052-13-104-1910-11

9. A raised carriage ramp and parapet hide the ground floor of this building. The architect who won the contest to design this building was told to reduce its height to two stories. A swimming pool inside this building was covered so that members of the press could have more space. This building was designed by James Hoban, who helped rebuild it after it was burned down in 1814. For 15 points, identify this building located at 1600 Pennsylvania Avenue, the residence of the President.

ANSWER: **White House**

233-13-104-19109

BONUS: What country's King Zog fled to the U.S. after his overthrow by Italy in 1939?

ANSWER: Republic of **Albania** [or Republika e **Shqiperise**]

014-13-104-1910-11

10. Brigham Young taught a Mormon doctrine that this Biblical character, not God, was the father of Jesus. The original wife of this man was a female demon named Lilith. This man's name derives from the Hebrew word for "earth". He is instructed to name "every beast of the field" and "every fowl of the air", then explains that he hid from God because he was naked and frightened. For 15 points, name this Biblical character whose rib was used to create his wife Eve.

ANSWER: **Adam**

190-13-104-19110

BONUS: This is a 30-second calculation question. To win a board game, you have to roll a 20-sided die, with faces numbered 1 through 20, and get a 1. What is the probability that you roll a 1 and your opponent does not roll a 1, if the events are considered independent?

ANSWER: **19/400** [or **0.0475**; or **4.75%**]

190-13-104-1910-11

11. During a visit to the United States, this man was disgusted by the film *Can-Can* and angry that he could not visit Disneyland. This world leader gave the "Secret Speech" against his predecessor. He banned publication of the novel *Doctor Zhivago*. This man banged his shoe on his desk in a 1960 UN meeting, and his country sought to install nuclear weapons during the Cuban Missile Crisis. For 15 points, name this leader of the Soviet Union who succeeded Josef Stalin.

ANSWER: Nikita **Khrushchev**

052-13-104-19111

BONUS: What mathematician names a set of fluid dynamics equations describing inviscid flow?

ANSWER: Leonhard **Euler**

014-13-104-1910-11

12. This author wrote about an aspiring pianist who becomes an opera singer named Thea Kronborg. In another of her novels, Joseph Vaillant and Jean Marie Latour travel to New Mexico. This author of *The Song of the Lark* and *Death Comes for the Archbishop* also wrote about the Nebraska prairie life of the Bergson and Shimerda families. For 15 points, name this regionalist American novelist who wrote *O Pioneers!* and *My Antonia*.

ANSWER: Willa **Cather**

014-13-104-19112

BONUS: What type of galaxies, typically near the center of clusters, lack entirely the arms characteristic of spiral galaxies?

ANSWER: **elliptical** galaxies

233-13-104-1910-11

13. The third of this man's rules states the sharing of edges and particularly faces by two anion polyhedra (pol-ee-HEE-druh) decreases the stability of an ionic structure. This man put forth his law for tetravalence bonding in 1932, along with a paper explaining the hybridization of electrons in bonding. This man used X-ray diffraction to determine the structure of a crystal. For 15 points, name this man with five laws that describe the structure of a crystal along with introducing the concept of electronegativity.

ANSWER: Linus **Pauling**

135-13-104-19113

BONUS: What 1992 treaty signed in a Dutch city created the European Union?

ANSWER: the **Maastricht** Treaty

014-13-104-1910-11

14. This man ignored George Canning's request to make a mutual declaration of foreign policy, making it unilaterally instead. A faithless elector prevented this man from winning every electoral vote for president. This Secretary of State for James Madison presided after the end of the Federalist Party during the "Era of Good Feelings." For 15 points, name this man whose "doctrine" demanded an end to European intervention in the Western Hemisphere.

ANSWER: James **Monroe**

121-13-104-19114

BONUS: What red dwarf is the nearest known star to our Sun?

ANSWER: **Proxima Centauri**

233-13-104-1910-11

15. An example of these organisms is responsible for the massive die-off of amphibians due to chytridiomycosis. These organisms form a symbiotic relationship with plant roots known as mycorrhizae. The cell walls of these organisms contain chitin. A mass of branching, filamentous hyphae in these organisms is known as the mycelium. A symbiotic relationship between these organisms and an algae is known as a lichen. For 15 points, identify this kingdom that includes molds and mushrooms.

ANSWER: **fungi** [or **fungus**]

066-13-104-19115

BONUS: This is a 20-second calculation question. What is the period of the sinusoid " $y = 3 \sin x$ "?

ANSWER: **2 pi** radians [or **360** degrees]

190-13-104-1910-11

16. A smaller-scale version of this event occurred in 541-542 AD during Justinian's reign. The peak of this event coincided with the peak of the flagellant movement. Popular explanations for this event included the miasma theory and the poisoning of wells by Jews. This event began after a siege of Caffa in Crimea and its victims' bodies were often piled onto death carts. For 15 points, name this pandemic that killed between 30-60% of Europe's population in the 14th century.

ANSWER: **Black Death** [or **bubonic plague**]

020-13-104-19116

BONUS: What mayor of Toronto drew criticism in 2013 when a video showing him smoking crack surfaced?

ANSWER: Rob **Ford**

015-13-104-1910-11

17. For an idealized soap bubble, the net form of this quantity is zero. In differential geometry, this value is given by the derivative of the unit tangent vector with respect to arc length. In general relativity, gravity causes space-time to have this property, an effect that can be visualized with the metaphor of a ball on a rubber sheet. For a circle, it is equal to one over the radius. For 15 points, name this quantity, denoted k , that measures how much something deviates from flatness.

ANSWER: **curvature**

127-13-104-19117

BONUS: What name is given to the moment of greatest intensity in a narrative, conventionally thought of as being followed by the “falling action”?

ANSWER: **climax**

014-13-104-1910-11

18. As of September 2013, Matt McCaslin is the highest-ranked American player of this activity. Joseph and Robert Taylor's company built many of the modern innovations used in this activity. In its early stages, this game was played on New York City rooftops. Several decades later, the Lomma brothers introduced trick hazards to this activity, such as spinning windmill blades that the player has to time to get past. For 15 points, name this eighteen-hole activity played on carpet or astroturf.

ANSWER: **mini-golf** [or **miniature golf**; or **crazy golf**; or **putt-putt**]

020-13-104-19118

BONUS: The Awami (ah-WAH-mee) League holds power in what Asian country where a 2012 factory fire killed 112 textile workers?

ANSWER: **Bangladesh**

015-13-104-1910-11

19. Near the beginning of this novel, the main character is comforted the servant Bessie after being locked in the red room where her uncle died. The protagonist of this novel is abused by Mr. Brocklehurst, the headmaster of the Lowood School. The title character goes to work at Thornfield Hall as a governess, a location eventually burned down by the master's crazy first wife, Bertha. For 15 points, name this Charlotte Bronte novel about the title woman and her love for Mr. Rochester.

ANSWER: **Jane Eyre**

052-13-104-19119

BONUS: What system, recently produced at CERN, consists of a positron orbiting around an antiproton?

ANSWER: **antihydrogen** [do not accept hydrogen]

233-13-104-1910-11

20. This character's mother died of scarlet fever shortly before he left for the university. He is temporarily imprisoned for the murder of his best friend, Henry Clerval. This man dies after telling his story to Captain Walton, who found him near the North Pole. This man, who is known as the “Modern Prometheus,” loves Elizabeth, who is murdered by his creation after he refuses to create a female creature. For 15 points, name this title character of a Mary Shelley novel, a scientist who creates a monster.

ANSWER: Victor **Frankenstein** [or **Victor**]

052-13-104-19120

BONUS: What type of equation relates a function's derivative to the function's dependent and independent variables?

ANSWER: **differential** equations

190-13-104-1910-11

21. In Act II of this play, one character has become blind and another has become mute. The set of this play consists of a tree and takes place on a country road. The inaction and anxiety of this play has led some to consider it as a representation of the Cold War. For 15 points, name this play that includes Pozzo and Lucky, a Samuel Beckett work in which Vladimir and Estragon do not meet the title character.

ANSWER: Waiting for Godot [or En Attendant Godot]

030-13-104-19121

BONUS: This is a 30-second calculation question. What is the volume of a sphere that is inscribed in a cube of volume 216 cubic feet?

ANSWER: 36 pi cubic feet

190-13-104-1910-11

22. NusA binds to a G-C rich stem loop in rho-independent termination of this process. Factors promoting this process may bind to TATA boxes in eukaryotes. Retroviruses such as HIV can carry out this process in reverse. This process is followed by exon splicing and the addition of a three-prime poly-A tail. For 15 points, name this process in which RNA polymerase copies a segment of DNA into RNA.

ANSWER: RNA transcription

237-13-104-19122

BONUS: What leader singer of Nine Inch Nails wrote film scores for *The Social Network* and *The Girl with the Dragon Tattoo*?

ANSWER: Trent Reznor

015-13-104-1910-11

23. This author wrote about the “bloomin’ idol made o’ mud-what they called the Great Gawd Budd” that the speaker encounters “on the road to Mandalay.” In another poem, the speaker says “you’re a better man than I am” to a heroic water bearer. This author wrote the poems “If” and “Gunga Din.” In a story collection, this man wrote about the mongoose Rikki-Tikki-Tavi and a boy raised by wolves named Mowgli. For 15 points, name this English author of *The Jungle Book*.

ANSWER: Rudyard Kipling

052-13-104-19123

BONUS: What college basketball coach won a national championship with Kentucky in 2012?

ANSWER: John Calipari

015-13-104-1910-11

24. The longest serving person to hold this office was Cordell Hull, who served under FDR. One holder of this position was a signatory of the Kellogg-Briand Pact. Through the "Corrupt Bargain," Henry Clay took this position following the Election of 1824. The first person to hold this position was Thomas Jefferson, and it is currently held by John Kerry. For 15 points, name this Cabinet position, whose holder deals with foreign affairs.

ANSWER: Secretary of State

140-13-104-19124

BONUS: Identify the Egyptian pharaoh who built Abu Simbel, was married to Nefertari, and was known to some as Ozymandias.

ANSWER: Ramses II [or Ramses the Great; or Ramesses II; or Ramesses the Great; prompt on Ramses; prompt on Ramesses]

123-13-104-1910-11

25. A complex of exhibits is found on this city's Museum Island; the most famous of those museums houses a reconstruction of the Pergamum Altar. A television tower with a stainless steel dome, known as the Fernsehturm, stands near a public square in this city known as Alexanderplatz. The river Spree flows through this city, home to a quadriga chariot that sits atop a massive triumphal arch. For 15 points, name this European capital, home to the Brandenburg Gate.

ANSWER: **Berlin**

020-13-104-19125

00--20-1910-11

26. During Reconstruction, this state was governed by Powell Clayton. Earl Van Dorn was defeated by Samuel Curtis in this state at Pea Ridge. The 101st Airborne Division was sent to protect black students in this state after the governor, Orval Faubus, prevented them from entering Little Rock Central High School. For 15 points, name this Southern state whose former governors include Bill Clinton and Mike Huckabee.

ANSWER: **Arkansas**

186-13-104-19126

00--20-1910-11



27. A nearly blind virtuoso who played this instrument produced a classic recording of "Tea for Two." Miles Davis personally sought out another player of this instrument, who composed "Watermelon Man," for his second quintet. The most recorded jazz standard "Round Midnight" was composed for this instrument, and its composer also wrote "Straight, No Chaser." For 15 points, name this instrument played by Art Tatum, Herbie Hancock, and Theolonium Monk, who improvised with crazy chords over 88 keys.

ANSWER: **piano**

121-13-104-19127

00--20-1910-11

28. Words for "below" "above" and "beyond" trigger nouns in this case. This case is taken by the objects of the pronouns "proxime," "secundum," "apud," "circa" "inter" and "per." The subject of an indirect statement is in this case. This case's singular forms end in "m" and its plural forms end in a vowel plus "s." For 15 points, name this Latin noun case most commonly used for direct objects of verbs.

ANSWER: Latin **accusative** case

019-13-104-19128