



1. A type of protein secondary structure denoted by this letter requires four amino acids, one of which must be a proline residue. This letter denotes the ratio of an object's speed to the speed of light. The carnitine shuttle is used to prime the breakdown of fatty acids in this type of oxidation. This letter and lactam denote the class of antibiotics including penicillin. The breakdown of a particle resulting in emission of either an electron or positron is this type of radioactive decay. For 15 points, name this Greek letter that denotes radiation intermediate in strength between alpha and gamma.

ANSWER: **beta**

245-13-104-04101

BONUS: This is a 20-second calculation question. Parallel lines AB and CD are intersected by line EF at points G and H, respectively. If angle AGE measures 20 degrees and angle DHF is acute, what is the measure of angle DHF?

ANSWER: **20** degrees

003-13-104-0410-11

2. The protagonist of this story is the author of an epic about Frederick the Great and has a vision of Socrates's dialogue with Phaedrus under a tree. A writer in this story eats overripe strawberries shortly before watching Jashu push his sickly companion down into the sand. In this story, the writer Gustav von Aschenbach succumbs to a cholera outbreak in a city where he lingers to admire the fourteen-year-old Tadzio. For 15 points, name this Thomas Mann novella set in a northern Italian city.

ANSWER: **Death in Venice** [or *Der Tod in Venedig*]

080-13-104-04102

BONUS: This is a 20-second calculation question. If the cosine of A is $\frac{2}{7}$, what is the cosine of $2A$?

ANSWER: **-41/49**

003-13-104-0410-11

3. The text of the Monroe Doctrine was mainly authored by this man while he was Secretary of State. This man won an election that included William Crawford as a candidate. He is the only President to follow his time in office by serving in the House of Representatives. Henry Clay agreed to serve as the Secretary of State for this President, in return for swinging the election of 1824. For 15 points, name this man who used the "Corrupt Bargain" to defeat Andrew Jackson and was the first son of a President to hold the office.

ANSWER: John Quincy **Adams** [prompt on **Adams**; do not accept "John Adams"]

023-13-104-04103

BONUS: What language had Doric, Aeolic, and Koine dialects in ancient times?

ANSWER: ancient **Greek**

019-13-104-0410-11

4. An alternative to mercury thermometers are red thermometers, which most often contain this molecule with red dye. A solution consisting 96% of this compound and 4% water is an azeotrope. Glucose is industrially fermented to form two carbon dioxides and two of these molecules. The liver uses ADH to convert this molecule into acetaldehyde, and it is used as an additive to gasoline. For 15 points, identify this two carbon molecule found in alcoholic beverages.

ANSWER: **ethanol** [or **ethyl alcohol**; or **drinking alcohol**; or **grain alcohol**; prompt on **alcohol**]

239-13-104-04104

BONUS: What Scottish biologist accidentally discovered both the enzyme lysozyme and a mold which produced the antibiotic penicillin?

ANSWER: Sir Alexander **Fleming**

020-13-104-0410-11

5. This philosophy was espoused by Spanish writer Miguel de Unamuno in *The Tragic Sense of Life*. This philosophy was used to argue that women are treated as "the Other" in the feminist text *The Second Sex*. This discipline "is a humanism" according to a lecture delivered by the author of *Being and Nothingness*, leftist intellectual Jean-Paul Sartre. For 15 points, name this philosophy that broadly concerns the way humans make their own meaning for their lives.

ANSWER: **existentialism**

080-13-104-04105

BONUS: What Latin poet coined the phrase "Carpe diem" in his *Odes*?

ANSWER: **Horace** [or Quintus **Horatius** Flaccus]

014-13-104-0410-11

6. The work function of a metal can be found by taking Planck's constant times frequency for the absorbed photon and subtracting this quantity for the emitted electron. The equipartition theorem sets it equal to three-halves times Boltzmann's constant times temperature. Its rotational component is proportional to the angular velocity squared. It is conserved in elastic, but not inelastic, collisions. Its change is equal to the work done on the system. For 15 points, name this quantity equal to half of mass times velocity squared, the energy of motion.

ANSWER: **kinetic** energy [or **KE**; or **E sub k**]

190-13-104-04106

BONUS: What piece by Pyotr Tchaikovsky includes excerpts from "La Marseillaise" and "God Save the Tsar" and commemorates the Battle of Borodino?

ANSWER: **1812 Overture** [or *The Year 1812*; or **Festival Overture in E flat major**]

030-13-104-0410-11

7. In this country, workers building the Stalinallee Boulevard rioted against the government in 1953. This country attempted to create a more efficient economy through Wolfgang Berger's New Economic System. Kurt Wismach shouted for free elections to be held in this country while Walter Ulbricht gave a speech. This country enacted a plan of "consumer socialism" while led by Erich Honecker. This country employed the Stasi police force and was where the Berlin Wall was built. For 15 points, name this former country that was reunited with its western counterpart in 1990.

ANSWER: **East Germany** [or **GDR**; or **German Democratic Republic**; or **Deutsche Demokratische Republik**; do not accept or prompt on "Germany"]

186-13-104-04107

BONUS: What woman known as "The Maid of Orleans" was burned at the stake in 1431?

ANSWER: **Joan of Arc** [or **Jeanne d'Arc**; or **Saint Joan**; prompt on partial answer]

015-13-104-0410-11

8. In a scene in this film, the protagonist is punched in the face by Mr. Welch, the husband of a teacher. In the last scene, the main character finds a copy of *The Adventures of Tom Sawyer*. The protagonist of this film is excited to discover his daughter Zuzu's petals in his pocket, which means that he is back in Bedford Falls and not the hellish Pottersville. In this movie, Clarence Odbody is an angel who wants to obtain his "wings." For 15 points, name this Frank Capra film about George Bailey, a man who wishes he had never been born.

ANSWER: ***It's a Wonderful Life***

052-13-104-04108

BONUS: What daughter of Tantalus was turned into a stone after boasting that her fourteen children were superior to Leto's twins?

ANSWER: **Niobe**

227-13-104-0410-11

9. A character in this poem is swallowed by Vipunen (VEE-poo-nen), from whom he extorts the magic words necessary to build a boat without using his hands. The earth is created at the beginning of this poem when a bird's nest falls off the knee of Ilmatar (ILL-ma-tar), who was impregnated by the wind and becomes the mother of Vainamoinen (VINE-a-MOY-nen). Later in this poem, Ilmarinen (ILL-ma-ree-nen) forges the Sampo. For 15 points, name this national epic of Finland.

ANSWER: the **Kalevala** (KAH-leh-VAH-lah)

142-13-104-04109

BONUS: What country's flag includes a depiction of its temple Angkor Wat?

ANSWER: Kingdom of **Cambodia** [or Preahreacheanachakr **Kampuchea**]

023-13-104-0410-11

10. The typical Werner complex consists of this element complexed with six ammonias and three chloride ions. Intrinsic factor is responsible for absorption of a vitamin with this element at the center of its corrin ring, deficiency of which causes pernicious anemia. That vitamin is vitamin B12. Like nickel and iron, this element is ferromagnetic. When bound to Al_2O_3 , this element forms a pigment that imparts a deep blue color. For 15 points, identify this element with symbol Co.

ANSWER: **cobalt** [or **Co** until it is read]

066-13-104-04110

BONUS: What Communist revolutionary unseated Fulgencio Batista and led Cuba from 1976 to 2008?

ANSWER: Fidel **Castro**

015-13-104-0410-11

11. A way to find this value is to take the sum of the first ionization energy and electron affinity and divide by two. The Allen scale for finding this value has its lowest end at cesium, which differs from a more common scale for this value that gives its lowest value, 0.7, to francium. That common scale for this value assigns its highest value, 3.98, to fluorine and is named for Linus Pauling. A large difference in this value between molecules usually results in an ionic bond. For 15 points, name this ability of atoms to attract shared electrons.

ANSWER: **electronegativity**

023-13-104-04111

BONUS: What shape is given by the simple formula $x^2 + y^2 = r^2$?

ANSWER: **circle**

014-13-104-0410-11

12. This party was blamed for a riot in Bath, Maine, and the related tarring and feathering of John Bapst. One of its Vice-Presidential nominees was the nephew of Andrew Jackson. This party contained many members from the Order of the Star Spangled Banner. This third party nominated Millard Fillmore for the Presidency in 1856, and its colloquial name refers to how its mostly anti-German and Irish members were supposed to deny being in this party. For 15 points, name this anti-Catholic, nativist political party in the 1850s.

ANSWER: **Know Nothing** Party [or Native **American** Party]

052-13-104-04112

BONUS: The test variety of what sport with wickets and overs is played at grounds such as The Oval, Lord's, and Old Trafford during the Australia vs. England Ashes series?

ANSWER: test **cricket**

153-13-104-0410-11

13. At a meeting after this event, Rose Schneiderman said she would be a traitor to those who died if she tried "to talk good fellowship." This event prompted the formation of a safety committee chaired by Frances Perkins, which proposed a fifty-four-hour work week, a proposal welcomed by Tammany Hall head Al Smith. After it was revealed that the stairs and exits had been locked by the owners during this incident, unions such as the International Ladies Garment Workers Union fought for improved labor conditions. For 15 points, name this deadly 1911 fire in a New York City factory.

ANSWER: **Triangle Shirtwaist** Factory fire

052-13-104-04113

BONUS: This is a 30-second calculation question. If cosine of x equals three over the square root of ten, and sine of x equals one over the square root of ten, what is the cosine of quantity four times x ?

ANSWER: **0.28** [or **7/25**]

003-13-104-0410-11

14. Eight men died trying to end this event in Operation Eagle Claw. Frank Reynolds was the original host of a show started during this event; that show, later hosted by Ted Koppel, was ABC's *Nightline*. Six people escaped this event thanks to the Canadian Caper. This event was ended minutes after the inauguration of Ronald Reagan. For 15 points, name this event during the Carter administration that lasted for 444 days and included fifty-two Americans being held against their will in Tehran.

ANSWER: **Iran hostage** crisis

023-13-104-04114

BONUS: This is a 20-second calculation question. What is the slope of the line containing the points (-2, 8), (1, -1), and (3, -7)?

ANSWER: **-3**

003-13-104-0410-11

15. This artist faced a roadblock when the pope forbade him from dissecting cadavers. This artist painted a mistress of Ludovico Sforza holding a stoat in *Lady with an Ermine*. He drew an image of a man superimposed over an image of the same man with arms and legs in different positions in his sketch of the *Vitruvian Man*. One of his portraits, also known as *La Gioconda*, depicts a woman with a famously enigmatic smile. For 15 points, name this Renaissance artist and inventor, who painted *The Last Supper* and the *Mona Lisa*.

ANSWER: Leonardo **da Vinci** [or **Leonardo** da Vinci]

015-13-104-04115

BONUS: What treatise defends the absolute rule of kings and calls the life of man "nasty, brutish, and short?"

ANSWER: **Leviathan**

014-13-104-0410-11

16. This compound is a byproduct in the production of the soda ash in the LeBlanc process, which is subsequently removed through the Deacon process. Ethylene and this compound are reacted to form the monomer in PVC. An older name for this compound is muriatic acid. A solution of this compound and nitric acid can dissolve gold and platinum. Gastrin stimulates this compound's secretion in the body. For 15 points, identify this acid found naturally in the stomach that has formula HCl.

ANSWER: **hydrochloric** acid [or **HCl** until it is read; or **muriatic acid** until is read]

239-13-104-04116

BONUS: Name the contemporary Indian novelist and political activist who wrote *The God of Small Things*.
ANSWER: Arundhati **Roy**

014-13-104-0410-11

17. This man confessed to using a fence post to kill Margret Whitehead. Much information about his background comes from a text published by Thomas Ruffin Gray. After seeing a solar eclipse, this man began to contact such comrades as Henry, Hark, Nelson, and Sam. This man's "confessions" were published by a white lawyer. His forces killed over fifty whites in Southampton County, while not distinguishing women and children. For 15 points, name this slave who led an 1831 rebellion in Virginia.
ANSWER: Nat **Turner**

052-13-104-04117

BONUS: What literary term refers to an elaborate, extended, and often far-fetched metaphor, often seen in the 17th century metaphysical poetry of George Herbert and John Donne?
ANSWER: **conceit**

045-13-104-0410-11

18. Reference frames that lack this property may be subject to so-called "fictitious" forces. Special relativity only applies to reference frames with this property, which must be non-accelerating. A rotational quantity named for this property is equal to $M R^2$ for a point mass and is known as its "moment". Aristotle misunderstood this concept, which allows for objects to keep traveling in straight lines. For 15 points, name this topic of Newton's first law, the tendency of a body to resist a change in motion.
ANSWER: **inertia** [or word forms such as **inertial**; prompt on **non-accelerating** until it is read]

132-13-104-04118

BONUS: This is a 30-second calculation question. Five justices on the Supreme Court, out of nine, write the majority opinion for a case. In how many different ways can those five justices be chosen?
ANSWER: **126**

190-13-104-0410-11

19. This man led armed warriors to confront an opposing general at the general's Indiana home of Grouseland. He declined a commission from Henry Procter honoring him for his efforts in the siege of Detroit. Future Vice-President Richard Johnson claimed to have killed this man at the Battle of the Thames during the War of 1812. His brother was Tenskwatawa (TENS-kwuh-TAH-wah), otherwise known as the Prophet. For 15 points, name this Shawnee leader who was defeated by William Henry Harrison at the Battle of Tippecanoe.
ANSWER: **Tecumseh**

052-13-104-04119

BONUS: What American economist and proponent of monetarism wrote *Capitalism and Freedom*?
ANSWER: Milton **Friedman**

014-13-104-0410-11

20. In November 2013, the BBC reported that this country had the right to get nukes delivered from Pakistan at will. In October 2013, this country was elected to, but turned down, a seat on the United Nations Security Council. This major backer of Syrian rebels has controversial laws prohibiting women from driving. For 15 points, name this state that produces more barrels per day than another other OPEC state.

ANSWER: Kingdom of **Saudi Arabia** [or **KSA**; or Al-Mamlakah al-'**Arabiyyah as-Su'udiyah**]

153-13-104-04120

BONUS: Which Pauline epistle, the longest, declares that "Death is the wages of sin?"

ANSWER: Epistle to the **Romans**

014-13-104-0410-11

21. This man posited a theory of behavior that acknowledges the influence of both social factors and the environment, reciprocal determinism. His best-known experiment focused on a similar area as his work *Adolescent Aggression*. The experiment he designed involved adult collaborators who punched the objects which name the experiment, causing the study's subjects to imitate them while yelling "sockaroo!" For 15 points, name this Canadian psychologist who performed the "bobo doll" experiment.

ANSWER: Albert **Bandura**

081-13-104-04121

BONUS: What English king was forced to sign the Magna Carta by his barons in 1215?

ANSWER: King **John** Lackland

015-13-104-0410-11

22. A character in this poem has the epithets "man-killing" and "breaker of horses." This poem begins with the word "menin," meaning "rage," and asks which of the gods caused two men to quarrel. It describes the death of Sarpedon, whose body is rescued by Apollo at Zeus's command. This poem describes the funeral games played in honor of Patroclus, whose death causes his friend to make peace with Agamemnon and seek out and kill Hector. For 15 points, name this Homeric epic about the wrath of Achilles during the Trojan War.

ANSWER: the **Iliad**

014-13-104-04122

BONUS: By what one-word name is rock star Paul Hewson better known?

ANSWER: **Bono**

045-13-104-0410-11

23. This man wrote a four thousand word love letter to the English artist Maria Cosway. He invented a revolving book stand that could hold five books at once, and, after the burning of Washington, he offered to sell his over six thousand books to the Library of Congress. At a private 1790 dinner, this man agreed to his rival's plan of federal assumption of war debts. This politician was accused of fathering children by his slave, Sally Hemings, who lived at his plantation, Monticello. For 15 points, name this author of the Declaration of Independence.

ANSWER: Thomas **Jefferson**

052-13-104-04123

BONUS: What Italian demonstrated his mastery of tenebrism (TEN-uh-briz-um) with the paintings *The Calling of St. Matthew* and *The Conversion of St. Paul*?

ANSWER: **Caravaggio** [or Michelangelo **Merisi** o Amerighi da Caravaggio]

015-13-104-0410-11

24. Definite finite automata accept a language, or set of these things. In C, these things are null-terminated, and they are operated on by regular expressions. The most well-known example of an immutable object is an instance of the class in Java known by this name. The constitutive elements of these things can be encoded with ASCII or UTF-8. These things are joined end-to-end by concatenation. For 15 points, identify this data type often implemented as an array of characters.

ANSWER: **strings**

066-13-104-04124

BONUS: What is the name given to the glass tube with a stopcock at the bottom that is used to dispense one solution into another during titration?

ANSWER: **burette**

014-13-104-0410-11

25. This quantity can be calculated as the square root of the ratio of the permittivity to the permittivity of free space. A material that is birefringent (BYE-ruh-FRIN-jent) has multiple values for this quantity. Snell's law gives the ratio of the angles of incidence as a ratio of this quantity for two mediums. It is equal to the ratio of the speed of light in a vacuum to that in a particular medium. For 15 points, identify this quantity that is important to a phenomenon that makes straws appear bent in water.

ANSWER: **index of refraction** [or **refractive index**]

226-13-104-04125

00--20-0410-11

26. The reaction of these things to stressful forces is called tenacity. Adding a drop of hydrochloric acid and seeing whether these things fizz can be used to test whether they contain carbonate. The color these things display in a powdered form is called streak. Their crystal lattice determines their properties of parting, fracture, and cleavage. The vast majority of Earth's crust is made up of the silicate type of these things. For 15 points, name these constituents of rocks.

ANSWER: **minerals** [prompt on **crystals** until "crystal lattice" is read]

066-13-104-04126

00--20-0410-11



27. This term can be applied to the title location of a novel consisting of a fictional manuscript by Avis Everhard in which most workers live in the city of Asgard. That novel is Jack London's *The Iron Heel*. In a novel set in one of these societies, Captain Beatty is the superior of the increasingly rebellious Guy Montag. The United States in Ray Bradbury's *Fahrenheit 451* is one of these places, because books are outlawed by the government. For 15 points, give this term for a usually futuristic society that is highly undesirable, the opposite of a utopia.

ANSWER: **dystopia** [or **dystopian**; prompt on **dictatorship**; prompt on **oligarchy**]

052-13-104-04127

00--20-0410-11

28. This man is told to "kiss the plaintiff and the wifey" in a call-out on Ludacris' "Number One Spot." In a popular video, he expresses confusion at what it means for Sting "to play us out" and repeatedly screams "WE'LL DO IT LIVE!" This author of *Killing Lincoln* and *Killing Kennedy* debated Jon Stewart in a "rumble" before the 2012 election. For 15 points, name this conservative commentator who hosts his namesake "Factor" on Fox News.

ANSWER: Bill **O'Reilly**

080-13-104-04128