

1. This principle explains why there is decreased solubility or ionization in a molecule through the common ion effect. This principle does not apply after the introduction of a catalyst to a system. Stresses on a system, such as a change in pressure, temperature, or concentration, cause the changes noted by this principle. For 10 points, name this principle named for a Frenchman that describes how a chemical system in equilibrium will respond to changes in order to establish a new equilibrium.

ANSWER: Le Chatelier's Principle [or Le Chatelier-Braun Principle]

023-10-34-05101

2. This figure added games in honor of Poseidon to the Isthmian Games, and this man got stuck in the underworld after agreeing to help his friend Pirithous rescue Persephone. The son of Aegeus, this man flung Sciron off a cliff. He also killed a man who hacked and racked people to fit into his bed; that man was Procrustes. This man accomplished one of his tasks with the help of the daughter of Minos, Ariadne. For 10 points, name this Greek hero who slew the Minotaur.

ANSWER: Theseus

030-10-34-05102

3. The second part of this battle is also known as the Battle of Bemis Heights. The first part of this engagement occurred at John Freeman's farm. Benedict Arnold suffered injuries to his leg at this battle. John Burgoyne was the British commander here and Horatio Gates was the American commander at this battle in New York. After this battle, France agreed to give military assistance to America. For 10 points, name this fall of 1777 American victory in the Revolutionary War that was a major turning point in the war.

ANSWER: Battle of Saratoga

001-10-34-05103

4. A coastline shares these shapes' property of having increasingly longer lengths when measured with shorter and shorter rulers. Because of that property, when these shapes have a depth of infinity, they have both an infinite perimeter and a finite area. Examples of these shapes include the Sierpinski gasket, the Koch Snowflake, which is created by successively adding triangles to each side of an equilateral triangle, and the Mandelbrot set. For 10 points, name these shapes which exhibit self-similarity on large scales.

ANSWER: fractals

004-10-34-05104

5. This quantity is thought to change as a result of the substitution and income effects according to the Slutsky Identity, which relates its Marshallian and Hicksian types. Its namesake law is violated by Giffen Goods, which unexpectedly exhibit it. It is expressed as a downward slope when graphed against price since it usually decreases as price increases. Defined as the ability and willingness of people to buy a good, for 10 points, name this quantity that, in a competitive market, must keep up with supply.

ANSWER: demand

079-10-34-05105

6. This character meets an old man who derisively calls another man "Bilgewater" instead of "Bridgewater." This character claims to be "George Jackson" while unwittingly inserting himself into a feud between the Sheperdsons and the Grangerfords. This character misses a turn at Cairo (KAY-ro), leading him and his traveling companion Jim down the Mississippi River on a raft. For 10 points, name this character who witnesses a murder with his friend Tom Sawyer, a picaresque title character of a Mark Twain novel.

ANSWER: **Huckleberry Finn** [accept either]

003-10-34-05106

7. This man wrote a play whose title character is a sorcerer whose liquor turns guests into monsters. In addition to *Comus*, this man wrote "Fame is no plant that grows on mortal soil" in an elegy written on the drowning of Edward King, "Lycidas." In Book I of his most famous work, the palace of Pandemonium is built and Beelzebub presents Satan's plan for revenge against God following their banishment from heaven. For 10 points, name this English poet of *Paradise Lost*.

ANSWER: John **Milton**

030-10-34-05107

8. In one story, this god disguises himself as the farmhand Bolverk in a successful attempt to retrieve the Mead of Poetry. This god sits atop the "high place" of Hlidskjalf, and that which he cannot see is recalled to him by his two ever-circling ravens, Hugin and Munin. This god, who hung from the world tree on the spear Gungnir to earn mastery of the runes, will be swallowed whole by the wolf Fenrir at Ragnarok. For 10 points, name this one-eyed chief god of the Norse pantheon.

ANSWER: **Odin** [or **Wodinaz**]

026-10-34-05108

9. This organ located in the sell turcica develops from a depression called Rathke's pouch. Its anterior section release two materials abbreviated LH and FSH. One material secreted by this organ sometimes known as vasopressin regulates the body's water retention while another material is released in females during labor and breastfeeding. For 10 points, name this organ that secretes antidiuretic hormone, oxytocin, and growth hormone, earning it the nickname the "master gland".

ANSWER: **pituitary** gland

064-10-34-05109

10. This civilization used runners called chasquis (CHAHS-kees) who sent messages via strings of beads called quipu (KEE-poo). The Aymara are one modern-day group that descends from these peoples. This civilization built Machu Picchu. The last leader of this empire, Atahualpa (aht-ah-HWAHL-puh), was overthrown by the conquistador Francisco Pizarro. For 10 points, name this pre-Columbian civilization that was centered in Cuzco, which was located in modern-day Peru.

ANSWER: **Inca** Empire [or **Incan**]

026-10-34-05110

11. In plants, this element opposes the action of potassium to close stomata while in the body, the sarcoplasmic reticulum stores and releases ions of this element. In the body this metal is typically found in the form of hydroxyapatite and the parathyroid hormone increases concentration of it in the blood. This element is also released into the blood through a process of resorption regulated by osteoclasts. In nature, this metal is found in the minerals gypsum and limestone. For 10 points, name this alkaline earth metal found in bones.

ANSWER: **calcium**

064-10-34-05111

12. This piece was commissioned for the consecration ceremony of the new Cathedral of Christ the Savior. The central conflict depicted in this composition is represented when the melody of the "Marseillaise" (mar-say-EHZ) overtakes "God Preserve Thy People." After the final quoting of "God Save the Tsar," cannons are set off to celebrate the triumph of Russia's army over Napoleon's invasion force during the title year of, for 10 points, what bombastic musical piece by Pyotr Tchaikovsky, that is often played at American celebrations of July 4th?

ANSWER: *The 1812 Overture* [or *The Year 1812: Festival Overture*]

019-10-34-05112

13. In some bacterias, this process is carried out in molecules containing retinal similar to rhodopsin ("row"-DOP-sin). This process takes place in the mesophyll, the first part in the thylakoids and the second part in the stroma. That second part of this process involves the creation of a glucose molecule during the light-independent reaction, which includes the Calvin cycle. For 10 points, name this process by which plants convert light energy into chemical energy using chlorophyll in chloroplasts.

ANSWER: **photosynthesis**

023-10-34-05113

14. Arguments for the winning side in this case were made by Linda Coffee and Sarah Weddington. *Doe v. Bolton* was a companion to this case, which came to include the intervening of Dr. James Hallford. The decision in this case was based in part on the precedent of the case *Griswold v. Connecticut*. The majority decision in this case was written up by Harry Blackmun and supported the cause of Norma McCorvey. For 10 points, name this 1973 Supreme Court case that legalized abortions.

ANSWER: **Roe v. Wade**

023-10-34-05114

15. This country was known as the Kingdom of Alba for much of the Middle Ages. Its ancient alliance with France was known as the "Auld Alliance." It was known as Caledonia to the Romans, and it was on the losing side at the Battle of Culloden in the last of the Jacobite Rebellions. It won independence at the Battle of Bannockburn under Robert the Bruce after an unsuccessful rebellion led by William Wallace. For 10 points, name this component of the United Kingdom found north of England with a capital at Edinburgh.

ANSWER: **Scotland**

015-10-34-05115

16. This city's original NBA franchise moved in 1979 to Salt Lake City, and their current NBA franchise moved in after the 2001-2002 season. This city is home to a stadium which has hosted, starting in 1978, more Super Bowls than any other. That stadium is also known for the Sugar Bowl and for serving as a makeshift shelter for many victims of Hurricane Katrina. For 10 points, name this city which is home to the Hornets, and whose Louisiana Superdome hosts the NFL's Saints.

ANSWER: **New Orleans**

082-10-34-05116

17. This author wrote a novella in which David Kepesh turns into the title body part. He included the short story "The Conversion of the Jews" in his first book, *Goodbye, Columbus*. Nathan Zuckerman narrates his novel *The Human Stain*. He also wrote a novel whose title character delivers a monologue about his sexual exploits to his psychiatrist, Dr. Spielvogel. For 10 points, name this author of *Portnoy's Complaint*.

ANSWER: Philip Milton **Roth**

024-10-34-05117

18. Kendall notation allows one to characterize models based on actual instances of this structure. Multilevel feedback scheduling uses these data structures. Double ended ones are possible while heaps and their variants are typically used to implement priority ones. This data structure supports a front operation and this data type is usually contrasted with a stack. For 10 points, name this data structure that is first in first out and are exemplified by lines at grocery stores.

ANSWER: **queue** [prompt on **FIFO**]

001-10-34-05118

19. The process of dividing a region into areas of different risk and potential for these phenomena is called microzonation ("MICRO"- "zone"- "nation"). These events are measured by the Mercalli intensity scale, and generate Rayleigh and Love waves in addition to p and s waves. The location of origin for one of them is called the hypocenter and the spot above it on the surface is called the epicenter. Their intensity can be measured by the Richter scale. For 10 points, name these events in which the ground shakes.

ANSWER: **earthquake**

001-10-34-05119

20. This ruler had a summer residence in Potsdam built for him called Sanssouci Palace (san-SUE-see). This monarch ushered in an era of modernization after winning the Silesian Wars and helping to oversee the First Partition of Poland. This man disregarded the Pragmatic Sanction when he chose to initiate fighting in the War of the Austrian Succession against Maria Theresa. For 10 points, name this enlightened despot from the Hohenzollern line, a Prussian king who was succeeded by Frederick William II.

ANSWER: **Frederick the Great** [or **Frederick II** of Prussia; or **Friedrich der Grosse**; or **Friedrich II**; or **Old Fritz**; or **Alte Fritz**; prompt on **Frederick**; prompt on **Friedrich**]

026-10-34-05120

1. One of this man's short stories centers on an apparatus that inscribes men's bodies with the law they are accused of breaking. This author of "In the Penal Colony" wrote a novel containing the "Parable of the Man Before the Law"; in that novel, Joseph K. is executed despite committing no crime. One of this author's characters dies from an apple lodged in his back; that character, Gregor Samsa, discovers his transformation into a disgusting insect. For 10 points, name this Czech author of *The Trial* and "The Metamorphosis."

ANSWER: Franz **Kafka**

080-10-34-05121

2. This man wrote about a creature that "launch'd forth filament, filament, filament" in a poem about a "noiseless patient spider." He wrote "Flood-tide below me! I see you face to face!" in his "Crossing Brooklyn Ferry." He published a "deathbed edition" of his continually revised masterpiece, which includes a poem beginning "I celebrate myself, and sing myself." For 10 points, name this American poet who included "Song of Myself" in his *Leaves of Grass*.

ANSWER: Walt **Whitman**

015-10-34-05122

3. His first book criticized the rationality of Euripedes' works, preferring the contrast between Apollonian and Dionysian in Aeschylus and Sophocles. This writer critiqued Christianity as a slave morality in works such as *Beyond Good And Evil*, and included a chapter entitled "Why I Write Such Good Books" in his autobiography *Ecce Homo*. For 10 points, name this German philosopher who declared "God is dead" in *The Gay Science* and imagined an "Übermensch" in *Also Sprach Zarathustra*.

ANSWER: Freidrich **Nietzsche**

082-10-34-05123

4. This leader survived a crushing defeat at Dyrrhachium (deer-RAWK-ee-um) to win a civil war. He built two concentric walls to besiege the city of Alesia, and wrote that "all of Gaul is divided into three parts" after defeating Vercengetorix (vur-sin-GET-uh-riks) there. This husband of Calpurnia won the battle of Pharsalus and made up the First Triumvirate with Crassus and Pompey. Like his lieutenant Mark Antony, he fell in love with Cleopatra. For 10 points, name this Roman dictator who was killed by Brutus and Cassius on the Ides of March.

ANSWER: Gaius Julius **Caesar**

015-10-34-05124

5. The main character of this play denies eating macaroons in the first act. The card that the syphilitic Dr. Rank sends this work's protagonist is overshadowed by another letter, and Kristine Linde is a childhood friend of the protagonis.. The bank employee Krogstad tries to blackmail the protagonist of this work regarding her forging of a loan. This play ends with Torvald forgiving his wife and begging her to reconsider her decision to leave the family. For 10 points, name this play about Nora Helmer, a work by Henrik Ibsen.

ANSWER: **A Doll's House**

030-10-34-05125

6. The monk Nennius described this man's twelve battles, inspiring Geoffrey of Monmouth, who popularized the exploits of this figure. This man is at the center of a series of twelve narrative poems by Alfred Tennyson, *Idylls of the King*. In a Mark Twain novel, he employs a resident of Connecticut named Hank Morgan. T. H. White is known for a four-part work about this man, whose "death" titles a work written in prison by Thomas Mallory. For 10 points, name this legendary king who possesses a round table.
ANSWER: King **Arthur**

015-10-34-05126

7. This organ, which contains a region called the fundus, produces a glycoprotein used in vitamin B12 absorption called the intrinsic factor. It also contains G cells which stimulate production of a material composed mainly of hydrochloric acid. This organ sends a material known as chyme from the pyloric sphincter into the duodenum, the first portion of the small intestine. In cows, this organ is divided into four compartments. For 10 points, name this main organ of the digestive system which breaks down food after receiving it from the esophagus.

ANSWER: **stomach**

064-10-34-05127

8. He used parallel chords, or "planing", in a piano work inspired by the myth of Ys, his prelude "The Sunken Cathedral". He parodied Clementi and Wagner in a set of piano pieces which opens with "Doctor Gradus Ad Parnassum" and was written for his daughter. Another piano work by this composer ends with a passepied, but is most famous for a D-flat major third movement inspired by a Verlaine poem. For 10 points, the *Children's Corner* suite was written by this French Impressionist whose *Suite bergamesque* includes "Clair de lune".

ANSWER: Claude **Debussy**

082-10-34-05128

9. In one play by this author, the sight of the protagonist stoking a coal ship causes Mildred Douglas to faint. In addition to that play about Yank, who dies in the hands of a zoo animal, this author wrote a trilogy in which Orin, Adam Brant, and Lavinia act out themes similar to the *Oresteia*. This author of *The Hairy Ape* wrote a play in which Mary's addiction to morphine paralyzes the Tyrone family. For 10 points, name this American playwright of *Mourning Becomes Electra* and *Long Day's Journey Into Night*.

ANSWER: Eugene Gladstone **O'Neill**

026-10-34-05129

10. When this man told his family that he was running for president, his mother responded "President of what?" This President initiated the SALT II talks and signed a treaty with Omar Torrijos (tor-REE-yos) that returned the Canal Zone to Panama. Minutes after this President left office, the Iran hostage crisis ended. This man was the main impulse behind Begin and Sadat signing the Camp David Accords. For 10 points, name this Georgia peanut farmer who was elected president in 1976 after defeating the incumbent, Gerald Ford.

ANSWER: Jimmy **Carter** [or James Earl **Carter**, Jr.]

026-10-34-05130

1. This religious practice is observed by most Chinese Buddhists, but is not common among Buddhists elsewhere.

[5] For 5 points, what is this behavior, which is common among many Indian religions but not required by Hinduism or Buddhism, and which involves refraining from the consumption of meat?

ANSWER: **vegetarianism**

[10] The only major world religion which requires vegetarianism of all its members is this Indian faith, which was founded by Mahavira and observes the principle of "ahimsa" or total nonviolence.

ANSWER: **Jainism**

[15] In Jainism, there are twenty-four of these "bridge-building" prophets who bring revelation and conquer evil, with Mahavira being the last one.

ANSWER: **tirthankaras**

[20] Tirthankara idols are worshipped by this sect of Jainism, which advocates monastic nudity and opposes the Svetambara sect.

ANSWER: **Digambara** [or **sky-clad** Jains]

019-10-34-05101

2. Answer some questions about Norse mythology.

[5] The Norse gods live in this realm, which is connected to Midgard by the rainbow bridge Bifrost.

ANSWER: **Asgard**

[10] This wielder of Hofund guards the Bifrost with his incredible senses of sight and hearing.

ANSWER: **Heimdall**

[15] This wife of Thor once had her golden hair chopped off by Loki.

ANSWER: **Sif**

[20] Loki and Thor once tested their mettle by visiting the hall of their giant, who had Thor wrestle with Death and Loki compete with Fire in an eating contest.

ANSWER: **Utgard-Loki**

080-10-34-05102

3. His introspective works include *Reveries of a Solitary Walker* and the 1782 *Confessions*.

[5] Identify this French philosopher, whose belief in the "general will" and human equality inspired many of the principal men of the French Revolution.

ANSWER: Jean-Jacques **Rousseau**

[10] Rousseau's major work of political theory is this book, titled for a common theory on the origin of government.

ANSWER: *The* **Social Contract** [or *Du* **contrat social**]

[15] The famous opening of the body of the first book of *The Social Contract* states that "man is born free, and everywhere he is" this.

ANSWER: **"in chains"** [or **"dans les fers"**]

[20] This Rousseau book puts forth a model for childhood education and attracted controversy due to its religious section narrated by a "Savoyard vicar" and the title character's relationship with the girl Sophie.

ANSWER: **Emile**

019-10-34-05103

4. This man gave the "House Divided" speech upon accepting the Republican nomination for Senator from Illinois.

[5] Name this man who lost that 1858 election but, two years later, won the Presidential election.

ANSWER: Abraham **Lincoln**

[10] Lincoln's opponent in the 1858 election was this incumbent Senator who also ran for President in 1860.

ANSWER: Stephen Arnold **Douglas**

[15] This "doctrine," best elucidated at its namesake debate, was Douglas's attempt to reconcile popular sovereignty with the *Dred Scott* decision.

ANSWER: **Freeport** Doctrine

[20] The *Chicago Press and Tribune* declared Lincoln the winner of the debates after this seventh and last one.

ANSWER: **Alton**

003-10-34-05104

RICE AND BEANS
AMERICANS
FIRE AND ICE
FANTASTIC BEASTS

RICE AND BEANS

[10] Rice University is located in this southern city.

ANSWER: **Houston**

[10] The Five Pecks of Rice Rebellion targeted the rulers of this dynasty, which was also targeted by the mystic Zhang Jiao in the Yellow Turban Rebellion

ANSWER: **Han** dynasty

[10] _The Bean Eaters_ was written by this African American author, who wrote about a group who “jazzed June” and will “die soon” in “We Real Cool”.

ANSWER: Gwendolyn **Brooks**

[10] Beans, like other legumes, perform this biological process which breaks a super-strong triple bond in order to form ammonia.

ANSWER: **Nitrogen fixation**

[10] Golden rice has been genetically engineered to carry more of this vitamin, whose derivative is a component of rhodopsin.

ANSWER: Vitamin **A**

[10] Elmer Rice is a playwright associated with this movement, whose abstract variety was promoted by Helen Frankenthaler and the painter of *The Moon Woman Cuts the Circle* and *Full Fathom Five*.

ANSWER: **Expressionist**

[10] ‘Beantown’ is a nickname of this city, which was the site of the Charles River Bridge v Warren Bridge case and a notable molasses disaster.

ANSWER: **Boston**

[10] This ancient Greek thinker believed eating beans was sinful. This man from Samos also showed that the ratio of 2/3s was important to music.

ANSWER: **Pythagoras**

[10] Mr Bean is a comedic figure played by this British comedic actor, who also played Johnny English

ANSWER: Rowan **Atkinson**

[10] The Shinto god of rice, Inari, has animal messengers of this form. Exceptionally old ones in Shinto myth can grow nine tails.

ANSWER: **Fox**

048-10-34-0510-3

AMERICANS

[10] What Serbian-born American championed AC current and feuded with Thomas Edison due to Edison's championship of DC current?

ANSWER: Nikola **Tesla**

[10] The burning down of the Misistuck, known as the Mystic Massacre, occurred during this war between a Northeast Indian tribe and the Massachusetts Bay and Plymouth colonies.

ANSWER: **Pequot War**

[10] Lynn Margulis was the foremost substantiator and supporter of this theory, which states that mitochondria and chloroplasts developed from bacteria ingested by cells.

ANSWER: **endosymbiotic** theory

[10] What playwright wrote about the Salem Witch Trials in *The Crucible*?

ANSWER: Arthur **Miller**

[10] What philosopher founded and led the Transcendentalist movement.

ANSWER: Ralph Waldo **Emerson**

[10] This Father of American and Modern Anthropology founded the Columbia University Ph.D. program; he also taught Margaret Mead and Ruth Benedict.

ANSWER: Franz **Boas**

[10] What President of the United States was impeached on charges of perjury and obstruction of justice by the House of Representatives in 1998, but was acquitted by the Senate in 1999?

ANSWER: William Jefferson "Bill" **Clinton** [or William Jefferson **Blythe III**]

[10] Jane Addams and Ellen Gates Starr founded this settlement house in Chicago.

ANSWER: **Hull** House

[10] The author wrote about a seaman impressed aboard the HMS *Bellipotent* in *Billy Budd*.

ANSWER: Herman **Melville**

[10] What name was given to a brand of journalism, used extensively in New York City, that is short on facts but long eye-catching headlines?

ANSWER: **yellow** journalism

066-10-34-0510-3

FIRE AND ICE

[10] What inhabitant of Seafoam Islands, an Ice-type Legendary bird, joined Zapdos and Moltres in the original Pokemon games?

ANSWER: **Articuno**

[10] Snowball is driven out by Napoleon the pig in what allegorical George Orwell novel about Stalinism?

ANSWER: **Animal Farm**

[10] What seven-tongued Vedic god represents fire in old Hinduism?

ANSWER: **Agni**

[10] Tony Snow was press secretary for what 43rd president who attacked the Taliban to start the War on Terror after 9/11?

ANSWER: George **Walker Bush** [accept **Bush 43**, **Bush the Second**, or other answers distinguishing him from “George Herbert Walker Bush,” his father, but not “Bush Jr.”]

[10] Snow falls at the end of what collection’s short story “The Dead,” set by James Joyce in the namesake city?

ANSWER: **Dubliners** [accept **The Dead** until the asterisk]

[10] In what ballet does Prince Ivan fight Kashchei the Immortal with a score by Stravinsky and the titular incendiary creature to help him?

ANSWER: The **Firebird** [accept **L’oiseau de feu**; accept **Zhar-ptitsa**]

[10] What 20th century songwriter of “White Christmas” also wrote “There’s No Business Like Show Business” and “God Bless America”?

ANSWER: Irving **Berlin** [accept Israel Isidore **Baline**]

[10] Who wrote the novels *Snow* and *My Name is Red* as a dissident in Turkey?

ANSWER: Orhan **Pamuk**

[10] An extra-long winter precedes what impending twilight of the gods from Norse mythology?

ANSWER: **Ragnarök**

[10] Fire Island is south of what island, itself south of a namesake “Sound” and home to the Hamptons, Brooklyn, and Queens?

ANSWER: **Long Island**

104-10-34-0510-3

FANTASTIC BEASTS

[10] Sir Percival stabbed what serpent-headed target of knights of the Round Table?

ANSWER: the **Questing Beast**

[10] Macnair fails to execute what beast saved by the Time-Turner, a hippogriff friendly to Harry Potter?

ANSWER: **Buckbeak** [accept **Witherwings**]

[10] A seven-headed, ten-horned Beast appears with the Whore of Babylon in what Biblical book predicting the end of the world?

ANSWER: Book of **Revelation** [accept **Apocalypse** of John or **Apokalypsis**]

[10] 2003 saw the death of what animal, who was “fantastic” for being the first cloned sheep?

ANSWER: **Dolly** the Sheep

[10] In what state did Francis Marion’s guerrilla tactics earn him the fantastic nickname “Swamp Fox” before the battles of Camden and Cowpens?

ANSWER: South Carolina

[10] The mythical “cinnamon bird” was described by what Greek who also described Xerxes in his role as “Father of History”?

ANSWER: **Herodotus**

[10] What poet wrote of a beast with “lion body and the head of a man” in “The Second Coming” and wrote “Easter, 1916” about his native Ireland?

ANSWER: William Butler **Yeats**

[10] What Canadian wrote of genetically mutated posthumans in *Oryx and Crake* and described a woman-hating dystopia in *The Handmaid’s Tale*?

ANSWER: Margaret Eleanor **Atwood**

[10] A lead-tipped arrow from Bellerophon killed what mythical Greek monster with lion, snake, and goat parts?

ANSWER: the **Chimera**

[10] What Germano-Norse hero slew the dragon Fafnir and went into a ring of fire to rescue the Valkyrie Brynhild?

ANSWER: **Sigurd** [accept **Sifrit** or **Siegfried**]

104-10-34-0510-3

1. These cells come in pyramidal and multipolar varieties. Protein synthesis in them takes place in Nissl (NISS-uhl) bodies. One component of them is protected by a myelin (MY-uh-lin) sheath, which may be formed of Schwann (SHVAHN) cells. They come in afferent and efferent types, which are also known as sensory and motor, respectively. They consist of a soma, dendrites, and an axon, and transmit impulses across synapses. For 20 points, name these cells of the nervous system.

ANSWER: **neurons** [accept **nerve cells** before "nervous"]

024-10-34-05101

2. This man composed a piece based on a Theodore Roosevelt speech in which Roosevelt preached the virtues of strife. In addition to "The Strenuous Life," this man composed an opera whose title figure was saved by Remus from being thrown into a wasp nest after protesting against her mother buying a "bag of luck." That work was *Treemonisha*. Interest in his music was increased after several of his works, such as "The Entertainer," were featured in the film *The Sting*. For 20 points, name this American composer, the "King of Ragtime."

ANSWER: Scott **Joplin**

030-10-34-05102

3. Population inversion is achieved in diatomic nitrogen and in this molecule in order to produce infrared light in the most commonly used form of laser industrially. In the body, a certain "anhydrase" enzyme converts this molecule into an anion. The bond angles of this molecule are 180 degrees, thus making it the textbook example of a molecule with linear geometry. At atmospheric pressure, it does not form a liquid, instead undergoing deposition from its normal form into dry ice. For 20 points, identify this greenhouse gas.

ANSWER: **carbon dioxide** [accept **CO2** prior to mention]

020-10-34-05103

4. These species are formed from carbon in an intermediate step of E1 and SN1 reactions. Type A of these species can be formed from alkali and alkaline earth metals. These species are created at the anode in an electrochemical cell, and are most easily formed from elements with low ionization energies. These species have an oxidation number equal to their positive charge. For 20 points, name these species that bind to anions in ionic solutions, and which are positively charged ions.

ANSWER: **cations** [prompt on **ions**; accept **carbocations** before "Type A"; prompt on **positively charged ions** or equivalents]

003-10-34-05104

5. The immense strain on cyclopropane (SY-clo-PRO-pain) is accounted for by the "banana" type of this interaction. A delocalized "sea of electrons" is the defining feature of a type found in metals. Molecular orbital theory was developed to fully understand this interaction, which involves the localization of charge on one of two participating atoms in an ionic kind. For 20 points, identify this interaction between atoms whose "single" and "double" varieties involve covalently sharing electrons.

ANSWER: chemical **bonds**

020-10-34-05105

6. One extension of this law states that the efficiency of a Carnot cycle is equal to the difference in temperature between the hot and cold reservoirs, divided by the temperature of the hot reservoir. One variant of this law states that one can never achieve 100% efficiency, while another variant states that the total entropy of the universe is increasing. For 20 points, name this law which most commonly states that heat never spontaneously flows from a cold source to a hot source.

ANSWER: **Second Law of Thermodynamics**

064-10-34-05106

7. The Fermi form of this quantity results from charged particles interacting with moving magnetic clouds, while Bremsstrahlung (BREM-"straw"- "lung") radiation results from charged particles with nonzero values for it. The tangential velocity squared divided by the radius yields its centripetal form. The square of the final velocity equals the square of final velocity plus twice the product of distance and this quantity. It is measured in meters per second squared. For 20 points, name this rate of change of velocity.

ANSWER: **acceleration**

001-10-34-05107

8. One explanation of this developed by Bolzano includes using two Greek letters to define an error and a distance. Known as the epsilon-delta definition of this function, L'Hopital's Rule gives a way to evaluate this function using derivatives for certain expressions. Often used to evaluate functions from the right or left side of an input, for 20 points, name this function that provides a value for an equation as it approaches a particular point.

ANSWER: **limit** function

084-10-34-05108

9. This composer's *Clarinet Concerto* was commissioned by Benny Goodman, while another of his works opens and closes with the "Open Prairie" theme and depicts the capture of the titular outlaw. He set music to the speeches of a certain President in his *Lincoln Portrait* and used timpani and a large brass ensemble for his *Fanfare for the Common Man*. This composer of *Billy the Kid* also created such ballets as *Rodeo* and one that includes the Shaker hymn "Simple Gifts." For 20 points, name this American composer of *Appalachian Spring*.

ANSWER: Aaron **Copland**

083-10-34-05109

10. The seventh and final one of these compositions by Jean Sibelius is in the key of C minor, and consists of only one movement. The fifth one composed by Gustav Mahler includes a fourth movement Adagietto. Joseph Haydn composed over one hundred of them, causing him to become known as the "father" of this musical form. Franz Schubert's final one is known as "the Great," while his eighth is nicknamed "the Unfinished." For 20 points, name these musical works for a full orchestra.

ANSWER: **symphony** [or **symphonies**]

004-10-34-05110

11. Algorithms for completing this process include AES and DES, both of which use block cipher algorithms. The asymmetric type of this process creates two components, one private and the other public, to do this action. Output from machines that did this process made up the British ULTRA. One of those machines was the Enigma machine. For 20 points, name this operation that uses keys to modify information into unreadable and readable forms through the use of ciphers.

ANSWER: **encryption** [or **cryptology**]

023-10-34-05111

12. These devices are susceptible to a superparamagnetic limit. An important statistic of these devices is their areal density. They come in 3.5 and 2.5 inch form factors. Their contents are divided into tracks, cylinders, and sectors. A major component of their access time is seek time. These consist of platters over which read/write heads move. Recently, some of these have been replaced by solid-state drives which use flash memory. For 20 points, name these devices that store files on a computer and have capacities measured in gigabytes and terabytes.

ANSWER: **hard drive** [or **hard disk**]

001-10-34-05112

1. The now-shrunken Lake Moeris was once connected by the Bahr Yussef canal into this river. The farthest reaches of this river are the infamously corpse-infested Akagera River and the Coptic-Church monastery paradise of Lake Tana. The latter is the source of a "Blue" namesake of this river, which possesses six regions of rocky rapids known as Cataracts, the very first of which is at the sight of Aswan. For 10 points, identify this river that flows through Upper and Lower Egypt.

ANSWER: **Nile** River

020-10-34-05131

2. The first generation of leptons consists of these particles and their respective neutrinos. The transitioning of these particles is the basis for the Balmer series. The positron is the anti-particle of this particle, which emits a photon when it drops in energy level. Robert Millikan determined their charge in the oil-drop experiment. They were first discovered by J.J. Thomson and were the only particle in his "plum pudding" model. For 10 points, name this negatively charged particle that orbits an atom's nucleus.

ANSWER: **electron**

064-10-34-05132

3. In one opera written in this language, the title water nymph sings the "Hymn to the Moon." In another opera written in this language, the poacher Harasta kills the titular animal. This language of *Rusalka* was used to write *The Cunning Little Vixen*, as well as the other operas of Leos Janacek ("YAHN"-uh-check). This is also the language of operas such as *The Brandenburgers of Bohemia* and *The Bartered Bride*. For 10 points, name this language of nationalistic operas by Bedrich Smetana and Antonin Dvorak (DVOR-zhak).

ANSWER: **Czech** [prompt on **Slavic**]

024-10-34-05133