

1. The rate-limiting step in this pathway is catalyzed by phosphofructokinase (FOSS-fo-FROOK-toe-KYE-nase) and, like the first step, requires a magnesium cofactor. The sixth step of this pathway transfers a phosphate group to G3P and attaches a hydrogen to NAD<sup>+</sup> (N-A-D-plus), while the seventh step transfers that phosphate group to ADP, recouping two of the initial ATP inputs. The last step of this pathway also creates ATP for a net of two ATP per input glucose molecule. For 10 points, name this pathway that breaks down glucose.

ANSWER: **glycolysis**

003-10-18-05101

2. The beginnings of this court case can be traced back to the efforts of George Rappelyea, who wished to promote the mining industry in Dayton. Its defendant had violated the Butler Act. The defense attorney in this case called the prosecutor up to the stand and questioned him about the validity of the Bible. Clarence Darrow and William Jennings Bryan were the main figures of, for 10 points, what 1925 court case whose defendant, a high school teacher, broke the law by teaching about evolution?

ANSWER: **Scopes** Monkey Trial [or *The State of Tennessee v. Scopes*]

083-10-18-05102

3. This man's association with the khlysty (KLEH-stee) religious group forced him to move to Kazan, where he became friends with many clergy figures. He gained his most famous position by saving the life of Anna Vyubova, and his death came about when he was poisoned, shot, and then dumped into the Neva River. Some speculate he may have used hypnotism to stop the bleeding sessions of Alexei, which helped him gain influence over Alexei's mother Alexandra. For 10 points, name this Russian mystic who served the family of Nicholas II.

ANSWER: Grigory Yefimovich **Rasputin** [or Grigory Yefimovich **Novykh**]

083-10-18-05103

4. This novel's protagonist yells at Teddy Henfrey and forces Thomas Marvel to be his assistant. After Marvel escapes to the town of Burdock, the title character is shot and finds his old colleague Dr. Kemp, who soon finds out about his experiments with changing the refractive index of objects. The title character, whose name is Griffin, is an albino who wraps himself up with bandages in order to conceal his most notable attribute. For 10 points, name this 1897 novel by H. G. Wells whose protagonist cannot be seen.

ANSWER: *The **Invisible Man***

083-10-18-05104

5. Two atoms of this element are appended in the Birch Reduction. One isotope of this element replaces a lighter isotope in a chloroform derivative used as a solvent in NMR. That isotope was discovered by Harold Urey. A compound in which this element is combined with oxygen is broken down by the enzyme catalase (CAT-uh-"lace"). Isotopes of this element include deuterium (doo-TAIR-ee-um) and tritium. Two of this element fuse to create helium. For 10 points, name this lightest element.

ANSWER: **hydrogen** [or **H**]

081-10-18-05105

6. One of this author's stories is described as "unpleasantly controversial and thoroughly unsuccessful" by his character Buddy. That story follows a ten-year-old Buddhist who predicts his own death aboard a ship. Along with "Teddy," this author collected "For Esme - With Love and Squalor" and the story of Seymour Glass's suicide, "A Perfect Day for Bananafish," in his *Nine Stories*. For 10 points, name this recluse, who also wrote about phony-hating Pencey Prep expellee Holden Caulfield in *The Catcher in the Rye*.

ANSWER: Jerome David Salinger

019-10-18-05106

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

064-10-18-05107

8. This man lost bids for the presidency when running with John Sergeant and Theodore Frelinghuysen. He developed an economic program consisting of high tariffs and infrastructure projects like road development in his American System. He finished fourth in the election of 1824, and then engineered a "corrupt bargain" as Speaker of the House to help John Quincy Adams win. For 10 points, name this Kentucky congressman and senator whose work with the Missouri Compromise and Compromise 1850 gave him his nickname as the "Great Compromiser."

ANSWER: Henry Clay

064-10-18-05108

9. **Pieces within this opera include the trio "Zitti, zitti" and the aria "Una voce poco fa." One character in this opera pretends to be the student Lindoro in order to deceive Dr. Bartolo. The title character of this opera repeatedly sings the phrase "della citta" in one aria. That title character aids Count Almaviva in wooing Rosina and sings the aria (\*) "Largo al Factotum."** For 10 points, name this *opera buffa* about the servant Figaro, composed by Gioacchino Rossini.

ANSWER: *The Barber of Seville* [or *Il Barbiere di Siviglia*]

080-10-18-05109

10. This work's twelfth chapter discusses the use of fire and other environmental factors. The 1910 translation of this book discusses the "nine situations," the use of spies, the laying of plans, and marching and maneuvering. This book was written during the Spring and Autumn Period and has been applied by Douglas MacArthur and Mao Zedong. For 10 points, name this Chinese text written by Sun Tzu (soo) as a manual for the leaders of armies.

ANSWER: *The Art of War* [or *Sunzi Bingfa*]

015-10-18-05110

11. The Enders-Weller-Robbins method directly helped the creation of this item, which took place in collaboration with Thomas Francis at the University of Pittsburgh. Albert Sabin modified it into an oral form, which is given as three initial doses and a booster. Research on this item was funded by the March of Dimes, which sought to end the childhood disease that struck Franklin Roosevelt. For 10 points, identify this medical breakthrough, discovered in 1954 by Jonas Salk, which has since wiped out a once-epidemic, paralysis-causing infection.

ANSWER: the polio vaccine

019-10-18-05111

12. On September 21, 2010, this country's prime minister Omar Sharmarke resigned from his post, citing conflicts between himself and president Sharif Ahmed as reasons. In August, 32 people were killed when the Muna Hotel in this country's capital was stormed by the insurgency group al-Shabab, which is currently at war with this country's government and peacekeepers from nearby Kenya and Ethiopia. For 10 points, name this African nation with its capital at Mogadishu which in recent years has also been the scene of many pirate attacks.

ANSWER: **Somalia**

083-10-18-05112

13. 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**

001-10-18-05113

14. The sociologist Ernest Burgess used this city's growth patterns as the basis for his "concentric zone model." The CEO of this city's public school system, Arne Duncan, was appointed Secretary of Education by Barack Obama. Steven Levitt used Sudhir Vankatesh's data about this city's drug trade to explain why dealers live with their parents. George Stigler, Ronald Coase, and Milton Friedman are associated with city's namesake school of economics. For 10 points, name this large Illinois city.

ANSWER: **Chicago**

015-10-18-05114

15. These two countries' relationship was strained after a 1999 incident in which one of them bombed the other one's embassy in Belgrade. Two years later, they clashed over the detainment of pilots following the Hainan Island incident. These countries directly fought each other after one side's commander approached the Yalu River during the Korean War. Relations between these two countries improved due to Ping Pong diplomacy. For 10 points, name these two countries that experienced normalized relations after a 1972 visit by Richard Nixon.

ANSWER: **U.S.A.** and People's Republic of **China** [or equivalents in either order; do not accept "Republic of China" for China]

064-10-18-05115

1A. What show on the Syfy channel centers around Agents Bering and Lattimer's mission to sequester artifacts in the titular facility?

ANSWER: **Warehouse 13**

1B. Beyond the event horizon, not even light can escape the massive gravitational field of what astronomical object?

ANSWER: **black holes**

2A. Bourbon Street spans the French Quarter of what city renowned for its celebration of Mardi Gras?

ANSWER: **New Orleans**

2B. What composer incorporated a theme from his *Danse Macabre* into his suite *Carnival of the Animals*?

ANSWER: Camille **Saint-Saens**

3A. This is a 10-second calculation question. What is the area of a trapezoid with bases length 8 and 10 and height 2?

ANSWER: **18**

3B. This is a 10-second calculation question. What is cosine of theta squared plus sine of theta squared?

ANSWER: **1**

4A. Name the equation with a "pre-exponential factor" that calculates the reaction rate given the temperature and the activation energy.

ANSWER: **Arrhenius** Equation

4B. What final Emperor of Brazil abolished slavery in that country and won the War of the Triple Alliance?

ANSWER: **Pedro II** of Brazil [prompt on **Pedro**]

5A. This is a 20-second calculation question. What is the probability of rolling a 6 with 2 die?

ANSWER: **5/36** [or **5:36**]

5B. This is a 20-second calculation question. What is the radius of a circle with equation  $x^2 + y^2 = 289$

ANSWER: **17**

6A. What Spanish verb, which means "to do" or "to make," can be used to describe the weather, or in expressions to indicate that an action has been occurring for a certain amount of time?

ANSWER: **hacer** (hah-SAIR)

6B. What substance is theorized as either MACHOs or WIMPs and is thought to make up around eighty percent of the universe?

ANSWER: **dark matter**

7A. This is a 30-second calculation question. What is a basketball player's career field goal percentage if he has made 2,020 field goals in 2,525 shots?

ANSWER: **80%**

7B. This is a 30-second calculation question. Simplify the equation  $2(x - x_{\text{sub naught}}) + 3(y - y_{\text{sub naught}}) + 8(z - z_{\text{sub naught}}) = 16$  if  $x$  and  $y_{\text{sub naught}}$  are equal to 1 and  $z_{\text{sub naught}}$  is equal to 0.

ANSWER: **2x + 3y + 8z = 21**

8A. Many mistakenly believe that followers of Santería practice animal sacrifice to drink this substance. Name this fluid symbolically consumed from Christ's body in the Eucharistic wine.

ANSWER: **blood**

8B. Name this Frederic Bartholdi sculpture, a torch-bearing copper-clad female in flowing robes which was presented as a gift to the United States from France and now stands in New York Harbor.

ANSWER: The **Statue of Liberty** [or **Liberty Enlightening The World**]

9A. What two-word name is applied to the massacre of several people in St. Petersburg protesting Nicholas II in Russia in 1905, as well as a day of several violent incidents in Dublin in 1920?

ANSWER: "**Bloody Sunday**"

9B. Name the NHL team that was led by Patrick Kane and Jonathan Toews (TAYVS) over the Philadelphia Flyers in the 2010 Stanley Cup.

ANSWER: **Chicago** Blackhawks [or Chicago **Blackhawks**]

10A. What author wrote the novel *Dead Souls* and the short story "The Overcoat"?

ANSWER: Nikolay Vasilyevich **Gogol**

10B. What man is of September 2010 the House Minority Whip and the congressional representative of Virginia's 7th district?

ANSWER: Eric **Cantor**

1. A double mutation of the gene Rb may lead to this phenomena occurring in the eye, and a regulator of a process associated with this disease is PUMA, whose expression is induced by the protein p53. That protein may initiate apoptosis, the programmed cell death whose absence is responsible for the proliferation of this disease, and manifestations of this disease can be classified as either benign or malignant. For 10 points, name this disease characterized by the growth of tumors.

ANSWER: **cancer**

081-10-18-05117

2. An easter egg in the second game of this series allows players to get the overpowered Scarab Gun. Multiplayer levels in that second game included Midship and Zanzibar. The third game in this series included a medal for killing thirty opponents without dying called Invincible, while ten straight kills made up a Running Riot. In 2010, a new game was introduced into this series, giving players control of Noble 6 set on Reach. For 10 points, name this Bungie-developed video game series whose first three entries focused on the actions of Master Chief.

ANSWER: **Halo**

023-10-18-05118

3. During one incident in this novel, a sand castle is destroyed by Maurice and Roger. Later, after the flashes of a dogfight in the atmosphere, a dead parachutist lands near Sam and Eric. A pig's head impaled on a stick appears to Simon as the title figure of this novel. Its characters learn how to start a fire with a pair of glasses and use a conch shell to call meetings. Ultimately, order breaks down and Ralph loses control to Jack. For 10 points, name this book by William Golding about a group of schoolboys marooned on an island.

ANSWER: **Lord of the Flies**

019-10-18-05119

4. This author wrote about an old man who drinks with an imaginary version of himself in his poem "Mr. Flood's Party." One of his poems begins by telling the title character to "Go to the western wall." Another poem tells of a "child of scorn" who "loved the days of old." As well as writing "Luke Havergal," this author also created the fictional inhabitants of Tilbury Town in such poems as "Miniver Cheevy" and one about a "gentleman from sole to crown" who "put a bullet in his head." For 10 points, name this American poet who wrote "Richard Cory."

ANSWER: Edward Arlington **Robinson**

083-10-18-05120

5. This military campaign was preceded by a victory for Baldwin IV at the Battle of Montgisard and the defeat of Raynald of Chatillon and Guy of Lusignan at the Battle of Hattin. One side in this campaign included forces of the Ayyubid Dynasty. The other side was led by the French ruler Philip II and Richard the Lionhearted. Frederick Barbarossa drowned during this military campaign, which was fought against the Muslim ruler Saladin. For 10 points, name this third of a series of European attempts to conquer the Holy Land.

ANSWER: **Third Crusade** [prompt on **Crusade**]

064-10-18-05121

6. One god associated with this object sometimes has his chariot drawn by a horse with seven heads and is named Surya. In Norse myth, the wolf Sköll chases this object, which was captured in Polynesian myth by Maui and his brothers. This object is also associated with the Shinto kami Amaterasu and in Hindu myth it was almost eaten by Hanuman, who mistook it for some ripe fruit in the sky. Often seen as a chariot being drawn across the sky, this is, for 10 points, what celestial object which is also associated with the Egyptian god Ra and the Greek god Helios?

ANSWER: the **Sun**

083-10-18-05122

7. In Sanskrit, any sequence of ganas can be classified as an example of this. When this structure is used incompletely it is called a catalexis (cat-uh-LEX-us). A pause in this structure is known as a caesura (SAY-zoo-rah). Varieties of this structure include dactylic hexameter and iambic pentameter, and this structure is usually divided into feet. For 10 points, name this literary term that refers to the basic rhythmic structure of poems.

ANSWER: **meter** [prompt on "prosody"]

084-10-18-05123

8. The Pendleton Act ended a debate in this group on the question of civil service reform that had divided it into Half-Breeds and Stalwarts. One president of this party signed the McKinley Tariff and the Sherman Antitrust Act. This party's first presidential candidate was John C. Frémont, and it absorbed most of the Free Soilers. It was the party of the President who was succeeded by Andrew Johnson and who issued the Emancipation Proclamation. For 10 points, name this political party of Abraham Lincoln that opposes the Democrats.

ANSWER: **Republican** Party [or **Republicans**; or **Grand Old Party**; or **GOP**]

079-10-18-05124

9. This deity is said to cause earthquakes when he writhes in pain because of the poison dripped on him by a snake. He took the form of a mare to give birth to the eight-legged horse Sleipnir. He is the father of the wolf Fenrir, Hel, and the Midgard Serpent. He tricked the blind Hod into killing his brother Baldur with a bow and arrow. He will kill and be killed by Heimdall at Ragnarok. For 10 points, name this trickster from Norse mythology.

ANSWER: **Loki**

024-10-18-05125

10. In one story by this author, a man kills his wife when she stops him from killing the title animal, Pluto. This author of "The Black Cat" also wrote a story in which Minister D hides the titular "purloined letter" in plain sight. That story features the detective C. Auguste Dupin, who discovers that an orangutan is the culprit in his story "The Murders in the Rue Morgue." Another of his stories details Fortunato's imprisonment by Montresor. For 10 points, name this American author of "The Cask of Amontillado."

ANSWER: Edgar Allan **Poe**

083-10-18-05126

11. 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**

082-10-18-05127

12. A character in this novel wins 43,000 rubles playing faro; the loser is unable to marry his cousin Sonya, and instead must save his fiancée Marya from an uprising of serfs. The lucky gambler, Nikolay Rostov, also hits on Helene and survives the resultant duel with this novel's protagonist, Pierre Bezukov. Pierre seeks glory by joining the fight against Napoleon in, for 10 points, what sprawling novel about the defense of Russia by Leo Tolstoy?

ANSWER: War and Peace [or Voyna i Mir]

019-10-18-05128

13. This work was commissioned by Elizabeth Sprague to use the working title, *House of Victory*. Its set was designed by Isamu Noguchi, and its title was taken from Hart Crane's "The Bridge." The storyline of this ballet follows two newlyweds moving into a new house in Pennsylvania. Martha Graham choreographed this work, whose seventh section features variations on the Shaker hymn "Simple Gifts". For 10 points, name this Aaron Copland ballet whose title refers to a mountain range in the eastern United States.

ANSWER: Appalachian Spring

080-10-18-05129

14. Robert Graves wrote an example of this genre called *Good-Bye to All That*. Ernest Hemingway's *A Moveable Feast* is one, and Richard Wright's *Black Boy* is this sort of work. The entirety of Mark Twain's will be published in November 2010. Maya Angelou's is entitled *I Know Why the Caged Bird Sings*, and another example in this genre is Henry Adams's *The Education of Henry Adams*. For 10 points, name this type of work in which an author describes their life and experiences.

ANSWER: autobiography [or memoirs; accept word forms]

001-10-18-05130

15. 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 10 points, name these devices that store files on a computer and have capacities measured in gigabytes and terabytes.

ANSWER: hard drive [or hard disk]

001-10-18-05131

1. This river's delta, located partially in the state of Para, sometimes includes the large island of Marajo. Formed from the confluence of the Ucayali and Maranon rivers, cities along its banks include Manacapuru and Obidos. Its navigability changes near the capital of Loreto and Maynas in Peru, the city of Iquitos, as well as near the city of Manaus, where it receives one of its major tributaries, the Rio Negro. For 10 points, name this river that flows through much of Brazil, a long South American waterway.

ANSWER: Amazon River

040-10-18-05132

2. Two figures, dressed in black and devoid of facial features, embrace in this painter's *The Kiss*, which joins his *Death in the Sick Room* and *The Vampire* in his series *The Frieze of Life*. Another of his paintings from that series was created during a time when the eruption of Krakatoa caused the northern European sky to turn red, perhaps explaining the background of that painting, which depicts a bald figure clutching his head. For 10 points, name this Norwegian painter of *The Scream*.

ANSWER: Edvard Munch

019-10-18-05133

3. The equation for this shape in polar coordinates is  $R$  of  $\theta$  equals  $A$ . A cycloid is the curve created by the path of a point on one of these shapes moving in a straight line. Venn diagrams portray intersections of these shapes, whose area equals  $\pi$  times  $R$  squared. For 10 points, name this shape created by finding all points of an equal distance from the center.

ANSWER: circles

004-10-18-05134

4. In this novel, the protagonist commits crimes with Jack Duane and works for the corrupt Mike Scully. Later, he goes to jail after attacking Phil Connor, who had slept with his wife Ona. The end of this novel focuses on a socialist rally whose speaker chants, "Chicago will be ours!" The protagonist of this novel is a Lithuanian immigrant named Jurgis Rudkus. And the outcry from this novel was largely responsible for the 1906 Pure Food and Drug Act. For 10 points, name this Upton Sinclair novel known for its graphic depictions of Chicago slaughterhouses.

ANSWER: *The Jungle*

064-10-18-05135

5. 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 10 points, name this rate of change of velocity.

ANSWER: acceleration

001-10-18-05136